

# Amateur Radio



Volume 74 No 5  
May 2006



The magazine for **AUSTRALIAN** radio amateurs

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# Amateur Radio

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## Our Cover this month

David McAulay VK3EW operating Commonwealth Games special event station AX3MCG, which he shared with Peter Forbes VK3QI. They were part of the month-long Amateur Radio Victoria activity that also involved AX3GAMES being activated by a roster of 17 operators across the state. Story on page 17 and IBC. Photo by Peter Forbes VK3QI.

### Contributions to Amateur Radio

Amateur Radio is a forum for WIA members' amateur radio experiments, experiences opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for publication. Articles on disc or email are especially welcome. The WIA cannot be responsible for loss or damage to any material. A pamphlet, 'How to write for Amateur Radio' is available from the National Office on receipt of a stamped self-addressed envelope.

### Back Issues

Back issues are available directly from the WIA National

Office (until stocks are exhausted), at \$4.00 each (including postage within Australia) to members.

### Photostat copies

When back issues are no longer available, photocopies of articles are available to members at \$2.50 each (plus an additional \$2 for each additional issue in which the article appears).

### Disclaimer

The opinions expressed in this publication do not necessarily reflect the official view of the WIA and the WIA cannot be held responsible for incorrect information published.

## Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs; that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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## Editorial comment

Peter Freeman VK3KAI

## Milestones

By the time this issue reaches readers, the Annual General Meeting will be about to occur in Sydney. This marks the passing of another milestone in the organisation, with an election of Directors occurring for the first time since the founding of the organisation as a national (as opposed to federal) body two years ago. It is clear that the Board and many other members are working hard to advance the organisation and our hobby. I encourage those of you able to attend the AGM to do so.

Interest in the Foundation Licence as an entry point to the hobby continues to grow. More of those 4-letter suffix calls are appearing on the bands and the rest of us are becoming used to the different rhythm of these call signs. Like any newly licensed operator, some will occasionally make errors. I trust that we all offer helpful advice to all new licensees when it is needed. Remember that whatever you say on air is a very public statement, so please take a second to consider not only what you will say, but how you SAY it as well.

## Ethics considerations for authors and publishers

One item that has been discussed at several meetings of the Publications Committee revolves around issues of copyright and permission to publish. These issues are ones that the author of an article should always consider and that a publisher must consider at all times. As editor, I must be mindful of the issues as I act on behalf of the WIA in selecting the articles to be published.

Under Australian law, copyright rests with the author unless it is formally assigned to another party. It has been the past practice of this journal to publish articles on the understanding that submission of an article for consideration for publication indicates that the author consents to the article being published in AR, if/when the article is approved and accepted for publication. That is, submission of the article has been taken to indicate permission to publish.

There have been some cases in recent

months where essentially the same article has been submitted to more than one magazine at the same time. We appreciate that one component of our hobby involves the sharing of information with our fellow amateurs. However, actions such as this (submission to more than one journal at the same time) are not reflecting ethical behaviour. The usual standard is that an article should not be submitted in essentially the same form to another journal/magazine whilst it is being considered for publication by a journal. If the article is rejected, then the author is free to submit the work to another journal for consideration. If it is accepted and then published, this does not prevent the author from using the substance of the work to create the work in a new form for submission to another publication (although, in scientific circles, writing a second article based on exactly the same data would be considered to be a form of scientific misbehaviour).

A further issue that we must consider as amateurs relates to agreements amongst IARU member societies. These agreements mean that an article published in, say, AR, can be re-published by the sister society in their journal (for example, in Break In, the journal of NZART), with appropriate recognition of the prior publication.

In an attempt to raise awareness of these considerations, a formal statement of expectations has been drafted and approved by the Publications Committee. That statement is printed below for your information. Authors are also reminded that a document is available on the WIA website giving them guidance in the preparation of their material.

## Basic rules for submissions to AR

Articles submitted for publication in *Amateur Radio* are accepted on the understanding that:

- the article is not currently on offer to any other publication;
- the article is an original work written and created by the Author;

continued on page 12

# On-air behaviour

I have received a number of letters and e-mails from members complaining about on-air behaviour.

I was listening on a country repeater some weeks ago, and I heard a Foundation licensee describing how badly he was treated when he attempted to operate on 40 metres for the first time.

Recently my wife heard my handheld tuned to a repeater, and she was concerned at the foul language being used.

I am told that some people have been threatened on air.

I have heard what appeared to be deliberate interference caused to an amateur station by another unidentified station.

I have been given a recording of an amateur station transmitting what can be charitably described as vitriolic political comment.

Some have suggested that the WIA should take action against amateurs guilty of such behaviour.

This is a topic that I have tried to avoid, as I realise that it is just too easy to sound self righteous and smug and appear to be preaching, all of which the WIA should not do. But it is not a topic that can be avoided, and I would like to put a position and invite comment.

Of course the WIA Board deplors such behaviour. That goes without saying.

That is not just some sort of value judgement in a vacuum. Our reasons go well beyond that.

We are committed to promoting the amateur service to the community generally. How easy is that when the privilege we seek is used in ways I have described?

We are committed to attracting new amateurs. How are we going to do that when the Foundation licensees have the experiences that I refer to?

We are committed to representing the amateur service nationally and internationally to ensure that the service has and retains the facilities it needs. But the amateur service is in competition with every other user and potential user of the radio spectrum for the right to use that spectrum, which is a limited resource. Is such behaviour a justification

for the allocation of spectrum to the amateur service in preference to our competitors?

Recently I came across a copy of the old Amateur Operators Handbook, which was marked as Revised December 1978 and published by the then Postal and Telecommunications Department.

At that time, the basic subordinate legislation were the regulations made under the Wireless Telegraphy Act 1905. In Chapter 6, General Provisions, it said the following:

**Prohibited Traffic**

*6.6 The operator of an amateur station is not permitted to transmit or receive:*

- (a) messages or visual images on behalf of third parties (however it is permissible for an amateur to arrange a schedule with another amateur station on behalf of a third amateur station);*
- (b) 'phone-patch' traffic;*
- (c) matter which is profane, obscene, indecent or otherwise objectionable;*
- (d) any message in consideration of payment in cash or kind;*
- (e) music (except for single or dual audio tones for tests of short duration) or other form of entertainment;*
- (f) news of or on behalf of, or for the benefit or information of, any industrial, commercial, political, social or religious organisation or any-one other than the operator or the person with whom he is in communication.*

Whether that accurately expressed the Wireless Telegraphy Regulations or not, and the extent to which it was enforceable is not the point. It represented a much more restrictive environment for the amateur.

Today there are no truly equivalent provisions to (c) and (f).

Even if there were such provisions today, I think that we would have to accept that what a quarter of a century ago was "profane, obscene, indecent or otherwise objectionable" will not

necessarily be found to be so today. Community standards change and have changed. What is acceptable on television today may well have been unacceptable 25 years ago.

We must be careful not to judge today's conduct by yesterday's standards, no matter how much we prefer the past.

But what are the offences and licence conditions that govern what may be loosely described as behaviour today?

There are provisions dealing with interference in the Radiocommunications Act 1992, see Part 4.2 of Chapter 4.

The closest is probably in section 108 of the Radiocommunications Act, which sets out certain additional conditions for a transmitter licence, including the condition that the licensee *(d) must not operate, or permit operation of, the transmitter: (i) in a way that would be likely to cause reasonable persons, justifiably in all the circumstances, to be seriously alarmed or seriously affronted; or (ii) for the purpose of harassing a person.*

Of course, behaviour that amounts to racial vilification or other conduct that is proscribed by other legislation can give rise to a breach of the relevant racial vilification or other legislation.

On the other hand I have no doubt that some of the behaviour that most would regard as inappropriate is also in breach of the law as it stands today.

What should the WIA do?

We do not think that the WIA should attempt to act as a law enforcement agency.

If the RACV in Victoria or the NRMA in New South Wales, both motorists' organisations, both advocating that their members always drive lawfully and safely, started handing out traffic infringement notices to their members, we suspect they would rapidly lose support.

We do not consider that it is the role of the WIA to become involved in law enforcement activities, which can so quickly be seen as provocative, and quite inconsistent with our primary role of representing our members and the amateur service generally.

*continued on page 12*

## WIA Releases New Assessment Packs and New Assessment Instructions

The WIA has released Assessment Packs for the Practical Assessment taken alone and not part of a Foundation Assessment, Standard Theory Assessment Packs, Standard/Advanced Regulations Assessment Packs and will release shortly the Advanced Theory Assessment Pack.

This means that WIA Assessors can conduct all levels of the amateur operator certificate of proficiency examinations, the qualifications for each of the three grades of amateur licence, with the candidates being given their results on the spot by the WIA Assessor.

With arrangements almost finalised to train more WIA Assessors in North Queensland, South Queensland, Sydney and Melbourne in the very near future, it is anticipated that the assessment system will continue to be very busy.

All of these changes have made a further and quite extensive revision of the WIA Exam Service's Assessment Instructions necessary. In addition, new and hopefully simpler forms have been introduced. The

revised Instructions have been sent today to each WIA Assessor, and will be placed on the WIA website shortly.

The continued development of the WIA Assessment system has involved a great deal of work by a number of people, said WIA President Michael Owen, VK3KLI.

*But what is important is that the clubs and the trainers encourage the new Foundation licensees to aspire to the Standard licence and then to the Advanced licence. Hopefully, this will encourage that progression.*

## Amateur licence fees increase

From 3 April 2006 the tax component of all radiocommunication licence fees was increased by the CPI and accordingly the yearly fee for all amateur licences increased by \$1 from \$58 to \$59.

## VK Foundation licences continue to grow

Last month AR reported that just four months after its introduction ACMA issued the 250th Foundation Licence.

In the week before the Easter break, the number of Foundation licences issued by ACMA passed 430.

## Foundation licensees prominent in the Subaru Rally of Canberra

Alan Hawes VK1WX reports that five new Foundation licensees participated in the rally on the weekend of March 11 and 12. They were Darren VK1FDZS, Brad VK1FRST, Shane VK1FSRB, Sam VK1FLYA (who is 14) and Phil VK1FPWH.

Alan quotes Bob VK1HBH, one of the operators in headquarters, "I would like to comment on the great performance of our recently licensed 'F' calls during the rally. I think our F calls acquitted themselves very well indeed with all of them holding their own with the more experienced operators. I think, too, that their operating technique improved markedly over the course of the weekend as they became more comfortable and confident in the WICEN operation. Some were under a lot of pressure for first timers in such an important event and they did well ... a real credit to their training and enthusiasm. The old hands obviously helped a lot but that is the spirit of amateur radio "around here now!"

BT

# WIA BPL Interference Advisory Service

Phil Wait VK2DKN  
Director

**Early In April the WIA Board of Directors moved to introduce a new BPL Interference Advisory Service for Australian amateurs.**

## Why a BPL Interference Advisory Service?

BPL trials currently operating in Australia cover small geographic areas. Very high levels of spurious emissions occur within the trial area and significant spurious emission levels are detectable up to about 2 km distant.

Due to the small size of the trials undertaken to date, only a few amateurs have been affected by interference from these BPL trials. Some of those amateurs have lodged interference reports.

More and larger BPL trials are now planned and it is expected greater numbers of radio amateurs may be adversely

affected by BPL interference. It is also expected that those radio amateurs will wish to lodge interference complaints with ACMA and the BPL trial operator.

ACMA advise they have investigated a number of complaints from radio amateurs of BPL interference which were found to be from non-BPL related sources.

The WIA believes that the responsiveness to, and efficiency in handling of, BPL interference complaints lodged by radio amateurs will be improved if complaints undergo a technical and administrative review process prior to being lodged with ACMA and the BPL trial operator.

## Avoiding incorrect interference complaints

Wrongly based interference complaints will damage our entire effort against BPL interference. Wrongly based interference complaints must be avoided.

All BPL interference complaints should be correctly identified as actual BPL interference prior to lodgment with ACMA or the BPL operator.

The WIA has been an active participant in ACMA's (formerly the ACA) previous work to provide a framework for trials of BPL systems. ACMA has recently notified the WIA of a forthcoming

review of the BPL trial guidelines and has invited the WIA's participation in this process. The WIA Board considers that complaints based on incorrectly identified interference may be used by others to discredit the amateur service, and to question all interference complaints by amateurs.

## Building a case of harmful interference

Lodging an effective interference complaint is not an easy task, and the WIA Board believes the WIA has an important role to play assisting radio amateurs to ensure that their interference complaints have maximum effectiveness.

An amateur lodging a BPL interference complaint should demonstrate that they have suffered "substantial interference".

Section 197 of the Radiocommunications Act (1992) creates an offence of recklessly causing "substantial interference" to radiocommunications. The amateur service is a radiocommunications service.

One way of showing "substantial interference" may be to show that where you were able to regularly communicate before the BPL system is enabled, and are now no longer able to communicate in exactly the same set of circumstances (time of day, frequency, other station etc.) when the BPL system was enabled. It would also be necessary to show that the interference continued after the person or entity responsible was notified of their causing the interference, the interference was verified as being caused by them, and they had sufficient time to rectify the situation.

## The WIA Service

A BPL Interference Advisory Service provided and funded by the WIA, available to all Australian radio amateurs, provides the following services:

### 1. Validation of interference as likely coming from a BPL source

#### Interference signature

All amateurs who suspect that they are experiencing BPL interference are encouraged to send an audio file of the interference to the Interference Advisory Service. The audio file should be recorded while very slowly tuning across the BPL signal in the SSB, AM, and FM modes,

or at least as many of those modes as possible.

Other useful information that should be included is the date and time (UTC), the make and model of receiver/transceiver, signal strength and the antenna type, eg dipole, Yagi, vertical or open wire.

#### Interference frequency Band

BPL interference will likely be confined to one or more bands of spectrum several megahertz wide. The frequency bands where BPL interference is noticeable should be recorded and submitted with the audio recording.

#### Location of BPL trials

The BPL Interference Advisory Service will check the licensee's location against locations of known BPL trials.

The BPL Interference Advisory Service will advise the amateur if the interference recordings submitted have a high probability of coming from a BPL source and, if so, make a recommendation to proceed to lodging a formal interference complaint.

### 2. Assistance in preparing and lodging an effective interference complaint

#### Showing "substantial interference"

Obviously it is helpful if amateurs keep a log of regular activity, especially where particular stations are contacted on a regular basis.

After suspected BPL interference is experienced, amateurs should make repeated attempts to contact the same stations at exactly the same time and same frequency and should log when the suspected BPL interference substantially disrupts or substantially disturbs (repeatedly and for long periods of time) communications.

If an amateur is no longer able to contact these stations after experiencing BPL interference then a case of 'substantial interference' can be made, though it is essential that it can also be shown to continue after the person responsible for the interference has knowledge of the particular interference, which is why the BPL operator must also be notified.

#### 3. The FSM software package

Owen Duffy VK1OD, in association with Ed Hare W1RFI of the ARRL, has developed a technique for accurately measuring the field strength of a signal

or noise using a standard amateur transceiver/receiver and a computer with sound card.

It assists an interference complaint if the background noise level was accurately measured prior to any local BPL activity, and again after BPL activation. Failing that, background noise level may be measured outside the BPL affected area.

The FSM software with operating instructions is available at <http://www.vk1od.net/fsm>. The WIA encourages its use and the BPL Interference Advisory Service will provide assistance should it be required.

The equipment to enable FSM measurements is commonly available, but not necessarily in every ham shack: a computer with Win98SE or later, sound card, FSM (free software), email and web browser; a receiver or transceiver; a known step attenuator (for example MFJ-762 or similar) are needed and an antenna of known gain (mobile whip preferably roof mounted or a half wave dipole) is also desirable.

#### How to access the service

Access to the service will be via the BPL webpage on the WIA website. The webpage includes information about the service, links to sound files of actual BPL interference, and downloadable forms.

Those wishing to use the service are asked to download their interference recordings and complete the appropriate forms. After analysis of the material a WIA BPL Interference Advisory Service representative will contact you by phone to discuss the best course of action.

## Plan ahead

### The Gippsland Gate Radio & Electronics Club Hamfest

On 22 July they will be conducting their Hamfest Sale at the Cranbourne Community Hall, Cranbourne.

## Stall holders

should book early as demand will be very high. contact

Dianne Jackson VK3JDI

on (03) 5625 2545

# A simple computer-to-radio PTT interface

Vince Henderson VK7VH

The age of digital modes is certainly upon us. Connecting a computer to a transceiver opens up a whole new world of communications.

Unfortunately, some older radios require a little work to overcome a few inherent problems. Anyone who has connected their computer to a transceiver will tell you that, in many cases, it is important to isolate the computer audio and comport PTT connections. This minimises the chance of unwanted ground loops. Other problems include radio PTT lines that carry large currents, and the need to disconnect or mute the microphone line.

Although it is possible to use the microphone input line to accomplish most connections, the constant need to manually switch between microphone input and computer sound card input can become a chore. Another problem is the need to make a separate connection to the speaker jack for audio input to the computer soundcard, when no audio output is available at the microphone connection. This is the case that I had with some of my older VHF and HF radios.

The diagram details a circuit that will overcome some of the problems. Whilst this is not the answer for all situations, if you have an accessory socket on the rear of the radio, or can adapt a way to insert a cable, the circuit may be a solution. A single rear entry point makes for a tidy set up. The circuit is used to switch a relay that will provide PTT and automatic isolation of the microphone input. If you use an interface that only needs an opto-coupler to switch the PTT for one of your radios, but require an alternative to switch PTT for other radios, then this circuit may be one solution. This can be achieved by inserting a separate switch immediately after the output of the opto-coupler and diverting the signal to T1 and on to the second radio PTT.

## Circuit description

U1 (IC1 on circuit) provides PTT isolation between the radio and the computer. The input to the opto-coupler is via pins 1 and 2. Pin 1 of U1 (a 6 pin DIL package) is marked by a dot on the top of the plastic case. U1 senses the voltage change state

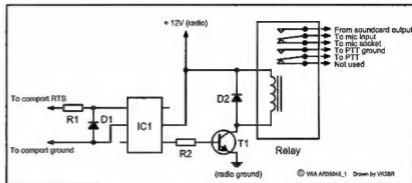


Fig 1 - Diagram 1

from the computer comport. R1 limits the input to U1 and D1 provides protection from reverse voltage. When U1 senses the input from the comport, this turns on the internal transistor output stage. Pins 4 and 5 of U1 are used to drive the base of T1. This in turn provides a current flow through the collector and emitter of T1. When T1 conducts, voltage is supplied across the relay coil. T1 could be any general purpose NPN transistor. The addition of D2 avoids back EMF from the coil.

## Mounting the bits

All the components may be mounted inside the radio. In my case I have an interface box that can switch outputs/inputs to multiple radios. U1, D1, R1, R2 and T1 are mounted inside the interface. The relay and D2 are mounted inside the radio. D2 is soldered directly across the coil pins. The important consideration is to mount the relay inside the radio as close to the internal microphone connections as possible. Use shielded cable for the microphone connections. However, do not connect the braid! Connecting the braid could induce ground loops. The +12 volts is obtained from within the radio at any convenient point. You should adapt the circuit and make the connections to suit your situation.

The PTT switching suits a wide range of radios. I use the circuit on a Kenwood TS-520S, an oldie but a goodie, an Icom IC-290 2 m multi-mode, and a Yaesu FT-212RH 2 m FM. All work without problems.

Most parts should be readily available from your local electronics parts supplier.

## Parts list

- R1 - 1 k (quarter watt)
- R2 - 4k7 (quarter watt)
- D1 - 1N4148
- D2 - 1N4001
- T1 - 2N2222A (NPN)
- U1 - 4N25 opto-coupler
- Relay - 12 volt DPDT miniature relay

## Plan ahead

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# It's radio Jim, but not as we know it

Bill Isdale VK4TWI

**A visitor to a museum of early radio technology may be rewarded with the sight of a spark-gap generator. Unfortunately, it won't be possible to see a demonstration of this early transmitter; it won't be operated, but not because the curators are afraid it would not work; the problem is rather that the simple and robust device would work perfectly well, just as it used to, in fact.**

It is now impossible to obtain a licence to operate one of these transmitters as they are the very thing that resulted in the establishment of radio spectrum regulators the world over. They have been driven from the spectrum because they occupied too much of it.

The spark, like its big brother, the lighting bolt, which does well without government regulation in the approximately 600 thunderstorms that are active somewhere in the world at any time, generates radio energy across the whole radio frequency spectrum.

Those parts of that energy that are in what we call the high frequency spectrum can be heard around the world, reflected by the ionosphere and contributing to the background radio noise of natural origin, like that which comes from the Sun and Jupiter, for instance. Jupiter, by the way, takes 11.86 of our years to orbit the Sun, a period that corresponds rather well to the solar cycle that has a major influence on the Earth's ionosphere.

Unlike lightning, the orbits of planets and the behaviour of our local star, it is possible for governments to regulate spark generators and other types of manufactured radio transmitters.

There are many other sources of radio frequency energy, such as the sparks from electric welders, and the noise from electric motors which humans are responsible for making, but are not subjected to much, if any, regulation as radio emitters since they are not connected to antennas and so do not get their signals out over great distances.

As radio became more widely adopted, it was necessary to find ways to keep the energy within narrow frequency limits so that users would not "interfere" with each other.

The development of radio communications has been carried on within the boundaries of the idea that the less spectrum space occupied the

better, since this made it easy to minimise interference, given the equipment available when that idea was adopted nearly a century ago. The application of this thinking has, in recent years, seen telecommunication companies buying the use of spectrum from governments which have declared that they own it, and paying hundreds of millions of dollars for the exclusive right to use a narrow piece of it.

In order to make some money out of their shareholders' investments, they have employed creative schemes such as time division and code division so that the available spectrum can be sliced and diced to allow the maximum amount of revenue-earning traffic to be carried over their networks, which are designed to use the frequencies for which they have paid a mint.

Recent communication devices of amazing capability exploit these technologies so that people can be encouraged to use them to send pictures to each other in order to show that they really are as happy as the sellers of these products suggest that they will be if they buy and use them.

You may notice that governments worldwide have claimed ownership of radio spectrum as that was thought, about a hundred years ago, to be the way to allow it to be most effectively used. It stopped many users all unintentionally jamming each other's transmissions as they could be allocated some space that they could occupy.

This does sound more than a little like the land title system, which starts with the government passing a law which it will enforce and which says that it

owns all the land. The land is then cut up into pieces and sold. The pieces have become progressively smaller and more expensive, especially if in a good location. The parallels with the radio spectrum are obvious.

That is all well and good for land; after all, humans want their own land and sharing it has not been vastly popular. The means of "owning" radio spectrum may have been all that suggested itself a century ago, but does it remain a good idea? If there is a better idea, don't expect those who have spent large amounts of money on buying spectrum to be keen to abandon a concept that maintains the value of their invisible asset. Perhaps, however, it is invisible because it isn't really suitable to be regarded as a private asset.

We can look out into space and feel that of its very nature no individual owns it. It has not been thought, at least yet, to be capable of being owned. Perhaps that is because there isn't any money to be made from owning it.

If radio spectrum space could be used in such a way that anyone could use any part without interfering with someone else, then the rationale for owning and selling little chunks of it would disappear. Also to disappear, of course, would be the book value of what has been bought for enormous

sums of money. Such a change would inevitably be resisted, just like land reform has historically been all over the world.

An electrical welder may be transmitting a bit of radio energy, as a side effect of welding, on a frequency where communications carriers are sending important data; important not necessarily of itself but important because they are

## South East Radio Group (SERG) Convention

Queen's Birthday Weekend  
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This year there will be a partner's trip on the Sunday. The trip will include the Nangula Market, Penola and possibly Coonawarra. There will be a small charge to cover costs.

Check the club website <http://serg.mountgambler.org/conv2006.html> for the convention program.

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charging to provide the service. The welder will not be stopped unless and until it "interferes" with the service that has paid to use the frequency. If there were no interference then there would be no need to exclude another use on the same frequency. Like space, it would assume its real character as something that is there for everyone. If people can use it without interfering with other uses, then why should anyone be denied the opportunity?

Enter, or re-enter, the spark generator. The very thing that led to locking up chunks of spectrum as if it was land might have the potential to free it again. Free it in our minds, that is; perhaps the lightning bolt and the welder illustrate that radio spectrum has always been free of the limitations which people have thought necessary to im pose upon one another.

The restrictions on using spectrum space may be seen as a product of the infant technology that existed when they were imposed. Maybe they are now outdated ideas that are holding back progress, as vested interests tend to do.

Progress, of course, will occur, and is about to bring onto the market radio

communications devices which will use what is called ultra-wideband. It is based on the insights of Gerald Ross, a communications engineer whose watershed paper on the subject was written in 1978. The rest of the world is only now finding just how useful are his ideas. The emission of very short pulses of energy, instead of sine waves, replace frequency regulation with timing. Fourier analysis shows that a nanosecond pulse of radio energy is the same as a thin smear of energy across a wide band. A pulse lasting a nanosecond, for instance, has an effective bandwidth of a gigahertz. Cutting the duration of the pulse increases the bandwidth in direct proportion. The greater the bandwidth, the more information can be carried. The immediate application of this technology will be by the microchip maker Intel that will exploit it for wide bandwidth networks carrying data between computers in an office or home.

The United States Federal Communications Commission, asked to license this, looked at it and saw their old enemy, the spark-gap generator. A public call for comments led to a flood

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of objections from those who feared the resultant jamming of aircraft anti-collision and instrument landing systems, GPS satellite navigation and more.

A compromise has allowed ultra-wideband to operate, not across the spectrum but between 3.1 and 10.6 gigahertz, with severe power limitations. The frequencies and power allowed will, it is said, reduce the effective range to some tens of metres but the system, like broadband internet over power lines, is a potential money-maker and will undoubtedly appear in Australia almost as soon as it does in the United States.

As for transmissions over a few tens of metres, the present standard for "Wi-Fi" networks was the subject of similar range limitation claims and at the 2004 "Defcon" conference in the USA a range record of 55.1 miles was set for that system, with an amplifier. The amplifier was then turned off and a record was set for distance with this system "barefoot" of, yes, 55.1 miles.

The practitioners of low power radio communication will be quick to point out that a few watts works just fine if there is a path open for the signal. Recent personal observation of a single side-band contact between Queensland and Victoria using 100 watts on 20 metres illustrates the point. My friend, ably assisted by me looking over his shoulder, was making the contact. Pointing the antenna towards VK3 brought no result, but pointing it the opposite way worked fine. Assuming that the front to back ratio of the beam antenna was as advertised, then the long path was producing the goods. Imagine the complexity of that path, VK4 to VK3 via the North and then South Polar regions. It happened to work. Significant path loss was inevitable, and a whole world of natural and man-made noise lay between the two stations.

Imagine a future where the lessons that communications engineers have learned in the half century since single side-band was invented are put to use. Our transceiver listens automatically around the bands available to amateur radio operators; sending some packets of data to any transceivers that are in operation and waiting for a response. It uses the whole of the available spectrum and negotiates minimum power with whatever other stations that it can reach. Like a modem, it tries out the options and can present us with an on-screen list of our potential contacts.

This has eliminated the manual search

for openings and the selection of band, power and mode. Our radio will check out the spectrum and put at our disposal what will actually work. We could proceed to communicate while the radio keeps updating the necessary tuning to maintain the link.

Look forward to some startling results in the use of ultra-wideband by experimenters who will demonstrate its effectiveness over ranges far beyond what those who are manufacturing the equipment would have envisaged. The extension of the same technology onto the HF bands on a "not to interfere with other uses" basis has the potential to open up world wide amateur radio links at quite low power levels, reducing enormously the likelihood of interference with other electronic equipment operated by people living nearby.

There will be no need to try to force a path by increasing radiated power when an available path can be found by using brain instead of brawn and where we can communicate without people who don't want our signals being inconvenienced by them. We will find that the emerging technology will satisfy our urge to experiment and innovate and that we can do so in ways that allow working the world without working up the neighbours.

What do you think you would see if you looked at a conventional signal on a spectrum analyser? A nice spike sticking up above the noise floor? Of course, that's what the machine was designed to show, so as to allow a radio signal to be seen. On the other hand, an ultra-wideband signal will be an undetectable smear of energy, which can be below the local noise floor; it can only be used because the receiver listens for it in the time domain and builds up the data a little at a time. Ultra-wideband will be very unobtrusive, perhaps providing a clue to its likely use over the last 30 years. This advance is about to trickle down from being of use to Generals to being of general use.

Enjoy the flow of information.

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# CW Central – a versatile keyer unit

Dale Hughes VK2DSH  
PO Box 7430  
Sutton NSW 2620

Having recently discovered the joys of QRP CW operation, I decided to adapt some hardware and firmware from a previously described CW transceiver (See reference 1) to build a stand-alone keyer for other transmitters.

The result of this is a device that can:

- Generate precisely timed strings of dots or dashes from a paddle type key.
- Transmit a pre-programmed message string, eg CQ CQ CQ DE VK..... This message can be loaded into the unit via the serial port. The operator can change the stored message at any time.
- Be used as code practice oscillator, producing five letter groups of random letters and figures.
- Generate CW directly from an ASCII serial input such as that generated by a personal computer or terminal.
- Provide automatic control of the press-to-talk line of a transmitter.

The unit is very easy to use and can generate high quality Morse code at word rates of approximately five to thirty words per minute. This word rate can be changed at any time by means of a rotary switch.

## Circuit description and construction

The device is built around an Atmel AT90S8535 micro-controller. This device contains 8 kbytes of program memory, 512 bytes of SRAM and 512 bytes of EEPROM. It is easy to use and readily programmed. Whilst not strictly necessary, and with the exception of the RS232 serial circuit, all inputs and outputs are optically isolated and well filtered to prevent the unit from generating radio frequency interference. Control signals to the attached transmitter are via 'dry' relay contacts, although the open collector outputs from the opto-couplers can be used to control an attached transmitter if relays are unsuitable for any reason. I used SFH615 opto-couplers because I had a supply of them - other devices could be used if required. In this case the current limiting resistors (R14 through R21) might need to be changed.

A 16-way BCD switch selects the word rate of the Morse transmission and speed changes are implemented by the firmware when the unit is not generating any code.

Serial data into and out of the device is converted to RS232 levels using the well-known and easy to use MAX232 (or similar) interface. A simple three-wire circuit is used, and no hand shaking has been implemented, as the data rate is quite low - limited by the transmission time of the Morse code.

Power to the unit is regulated down to 5 V DC using a 7805 regulator. The supply is well filtered to prevent any RF from nearby transmitters affecting operation of the micro-controller. Inductor L1 consists of 10 turns of wire, wound on to a 12 mm toroidal core salvaged from an old computer power supply. The unit consumes approximately 30 mA of current when no relays are energised.

Resistor R13 can be adjusted to vary the volume of the side-tone heard on the loudspeaker. I found that 100 ohms produced a satisfactory volume when using a small 8 ohm loudspeaker.

A small diecast box (Jaycar HB5067) houses the circuit board and switches. The unit can be built on 'Vero-board' if required as the circuit is straight forward; or a printed circuit board can be manufactured if desired.

## Operation

There are two operating modes for the unit and these are selected by the position of the PTT switch. If the PTT switch is not actuated, ie open circuit, the keyer is in the 'practice' mode and the user hears a tone from the unit when any sending function is activated. The PTT and keying relays do not operate in this case.

Activating the PTT switch puts the keyer into 'live' mode and the PTT and keyer relays are activated when transmission of any Morse characters is

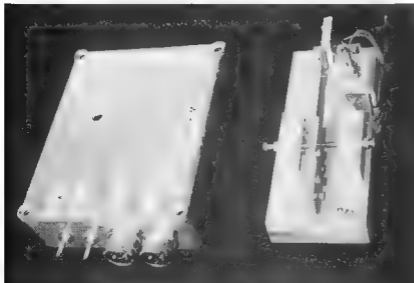
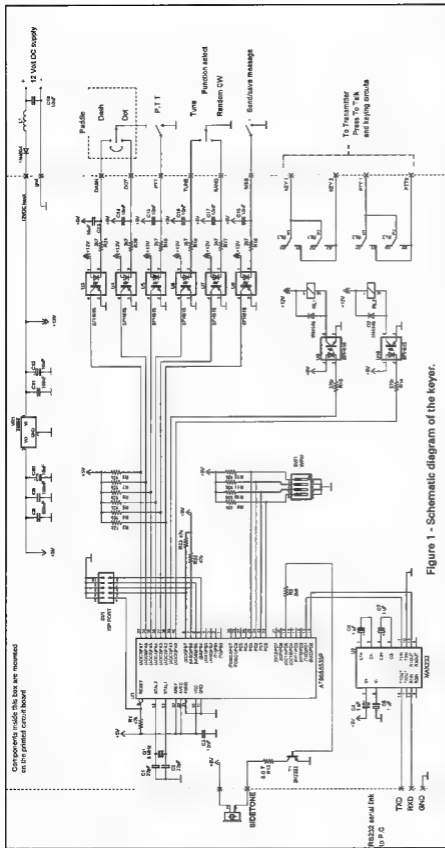


Photo 1 - The keyer and associated paddle. Connections to the paddle and the transceiver are made by means of the 5-pin DIN connectors on the front of the keyer box.



**Figure 1 - Schematic diagram of the keyer.**

required. In this mode it is expected that side-tone is generated by the attached transceiver. Note that the PTT relay switches approximately 30 milliseconds before the keying relay switches and that the PTT relay stays closed for approximately 1 second after the last dot or dash is sent. The delay in switching prevents transmit/receive switching when the transmitter is generating a signal. It is not necessary to operate the PTT switch between 'overs' as the PTT relay is switched when any transmission mode is selected.

The exception to the above is the 'tune' switch. If this switch is operated, the PTT and keying relays operate – separated by a short delay – and a local side-tone is generated. This allows an associated transmitter or antenna-matching unit to be tuned if required.

Selection of the random CW mode, or transmission of the stored message, occurs when the appropriate toggle switch is operated. Manual transmission occurs any time the paddle is operated. Characters received by the serial port are saved in a type-ahead buffer and are transmitted as Morse code at the selected word rate. The characters in the buffer may be copied into CPU non-volatile memory (EEPROM) by depressing the 'stored message' switch any time before the message transmission ends. When this is done, and at the conclusion of the current message transmission, a message is sent from the keyer to the attached computer or terminal to indicate that the memory has been updated.

Random characters are generated using a 15 stage shift register with feedback (see reference 2). This produces a long sequence of random characters and such systems are called 'pseudo-random number' (PRN) generators. Such a system can be implemented in hardware using a shift register with feedback derived from various points along the register which is then combined using exclusive or gates. In this keyer the same sort of system was created using software inside the micro-controller. An example of a typical sequence generated by the

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Over time, all possible  
Morse characters and numbers  
are generated and character  
sequences will repeat after  
approximately 4000 cycles. The  
random character groups are also  
transmitted out of the RS232  
port so a terminal or computer  
can capture them. The captured  
text can then be compared to  
what was copied from the Morse  
code.

Generation of the random  
characters was probably the most  
interesting part of the software  
development and a number of  
different methods were tried  
before settling on the PRN  
approach. Readers interested  
in random number generation,  
codes and ciphers are directed to  
chapter 8 of reference 3.

## Conclusion

The keyer described here has proven  
itself to be exceptionally pleasant to use  
and easy to build. I am happy to provide  
the firmware (AVR Studio4 assembler)  
and printed circuit board layout (EAGLE  
CAD format) to anyone who is interested;  
please write to me at the address given at  
the beginning of this article.

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## WIA Comment continued

We believe that we can appeal to  
amateurs to ensure that their conduct is  
appropriate, suggest that amateurs avoid  
provocative statements which incite  
aggressive responses, suggest amateurs  
choose frequencies that accord with band-  
plans and the general pattern of amateur  
usage, urge amateurs not to respond  
to provocative behaviour and deplore  
inappropriate conduct generally.

In the end, if the regulator is failing  
to act when presented with clear and  
unambiguous evidence of wrong doing,  
the WIA will request the regulator to  
act against those clearly in breach of  
the law.

I doubt if further regulation is the  
solution. It shouldn't be. We argue for our

privileges on the basis that the amateur  
service is basically self-regulating. Surely  
we can behave in an acceptable way  
without an enforcement officer standing  
over us?

I appreciate that only a small minority  
of amateurs behave in the way I describe,  
and indeed some conduct, while annoying,  
is harmless and is the sad evidence of  
ageing, alcohol or some other cause.

I hope that we never get to the position  
that some countries find themselves,  
where the repeaters exist but are not used  
because of the behaviour of a few.

But for whatever reason, when an  
amateur behaves badly on air, it is  
behaviour in a very public place. We  
all suffer.

## Editorial continued

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# Antenna Analyser revisited

DAVID NINE VK5JST

Turn your Antenna Analyser into a multifunction instrument with the ability to measure LCR (R for resonance); plus upgrade modifications, measurement ideas, and more.

In May 2005, Jim VK5JST published *An experimental HF aerial analyser* in *Amateur Radio* magazine. To date, a large number of analysers have been built and I must say I'm very happy with the performance from mine.

I have written this article primarily to demonstrate just how versatile the Analyser can become and how some simple modifications can further enhance it. If you missed the boat it's not too late to build one. You can go to Jim's website at <http://www.users.on.net/~endsodds/analr.htm> or contact the Elizabeth Amateur Radio Club at PO Box 8, Elizabeth, SA 5112, or email Keith Gooley at [keith.gooley@dsto.defence.gov.au](mailto:keith.gooley@dsto.defence.gov.au). The cost of the Analyser kit is a mere SAUS117 which includes postage within Australia. This information is given in a link from the above website, but is included here for those without Internet or email access.

And before I go any further, I must congratulate Jim, Keith and all those involved from the Elizabeth Amateur Radio Club on the design, and for the effort in putting together such a great kit (see photo). This kit would have to be one of the best I have come across.

## My experience

Probably, like most others who purchased the kit, I just assembled it according to the instructions and turned it on. Well, it didn't work! But, after a couple of minutes measuring voltages, I discovered I had missed a solder pad on one of the ICs. With this fixed, away it went.

Being curious about using a PIC, in particular this series that provides such a simple computer interface, I thought I'd look at the program listing. To my surprise it was coded in Basic which would have to be the easiest programming language to use. I was soon making my own changes. I encourage anyone who is computer-literate to have a go. What you will find is that the maths is rather tricky as the PIC doesn't provide functions like square root, nor does it allow for floating point numbers like pi (3.14159), just to point out a couple of its limitations. However,

working through the program listing will show how the various constraints have been overcome and give you a chance to test your ideas. Working around these issues is part of the fun.

## Software update

I was initially interested in tidying up the display by removing unnecessary zeros but realised that, if we know the reactance and the frequency, it's possible to calculate capacitance and inductance. What followed was a software update to allow component measurement without any hardware modifications. My software update, and other modifications and information, are available from my website <http://members.optusnet.com.au/dpmilne/>. The software is also available from Jim's website mentioned above, which provides additional information related to programming the Analyser. For those frightened by updating your software, don't be – it's really easy for anyone that plays with computers. Hint – I put a 3.5 mm stereo socket in the side of my Analyser so I could easily program it without opening the case. An old mouse provides a great serial interface cable.

## How it now works

The Analyser has two modes: either a 4 or a 5 digit frequency display (the 4 digit mode provides a much quicker display update). By turning on the Analyser in 4 digit mode you start it in component function; switch to 5 digit mode and it's in analyser function; switch back to 4 digit mode and it remains in (4 digit) analyser function. Turn it on in 5 digit mode and it's in analyser function. The component measurement function is only available as a switch-on option in 4 digit mode. This allows both the operational functions without hardware changes.



## Modifications

When setting up the Analyser, I was measuring the DC voltages on TP2, TP3 and TP4 and discovered, purely by accident, that they would change at the touch of my measuring device, even a high-impedance multimeter. These are the voltages read by the PIC – the internal processor that does all the hard work – and are clearly very sensitive. This can be fixed by bypassing each of the three test-points with a good quality 10 nF capacitor. Simply solder the capacitors directly from the test-points to the ground-plane using the shortest lead lengths possible.

When I constructed my Analyser, I allowed for an extra switch position in case I ever wanted to try to extend the frequency, which I have now done. Checking its value with the Analyser in component function, I wound a 330 nH inductor (10 turns, 0.5 mm wire, 5 mm diameter) and soldered it into the extra switch position. (Jim had already anticipated that somebody might want to do this, and allowed for it with the switch and circuit-board design – well done!). Remarkably, my Analyser now runs to just over 60 MHz. However, a warning! This modification is really pushing the limits of the design and components, and it may not work correctly for you or there may be significant errors. Paying particular care during construction to ensure you have minimum component lead lengths, as per the construction guide, is very important and will maximise your success. Having said that, mine seems to behave well in the 6 metre band, at least up to 2:1 SWR measurements, and I know of others that perform OK as well.

There are other modifications, details of which can be found on my website. If anyone has any modifications, and would like them published on my site, then I'm happy to make them available with relevant acknowledgements.

## Operation

With the software update you should now be able to measure capacitance from about 10 pF to 25,000 pF, and inductance from about 25 nH to 60,000 nH. The units displayed always remain as pF and nH although my next software revision will include auto-ranging to nF and  $\mu$ H. However, it cannot differentiate between L and C so that has been left to you. A side benefit is that, when you measure an inductor, the displayed capacitance

will resonate with the inductor at the frequency shown. As the Analyser can measure inductance down to short lengths of wire it is quite a useful tool.

Be aware that there may be errors up to 20%, or possibly more, due to quite a few different reasons which I don't intend to expand on here. For best results it's generally optimal to have the X value between 50 and 100 ohms although I have set the calculation limits at 5 and 500 ohms. Long capacitor pigtails will also add to errors. You may get unpredictable results measuring capacitors that are not designed for RF applications.

## A couple of interesting applications

For the following examples you can use the Analyser in either function unless you specifically want to measure component values.

You can determine the impedance of transmission lines by connecting a length of transmission line and measuring the X values when it's unterminated (open), then shorted. The impedance is calculated as  $\sqrt{(X_{open} \times X_{short})}$ .

With an unterminated length of coax, when its length is a quarter wavelength at the applied frequency (or an odd multiple, ie  $\lambda/4$ ,  $3\lambda/4$ ,  $5\lambda/4$ , etc) it will behave as a series tuned circuit, ie a "short circuit" with a very low impedance. So if you adjust the Analyser for a minimum X then you have the frequency corresponding to a quarter wavelength or odd- multiple quarter wavelengths. The other piece of information you need to calculate the length is the velocity factor of the cable concerned; due to distributed L and C within the cable the signal slows down and this slow-down is known as the velocity factor. For example, most RG58, RG8 and RG213 coax cables have a velocity factor of 0.66, whereas for open wire feeders this will be 1.0, or slightly less. That means that whilst a quarter wavelength in free space at 15 MHz would be 5 metres, through RG58 it would only be 3.3 metres (refer to the maths section below). Therefore, the Analyser can measure a quarter wavelength of RG58 cable from 1.65 metres (30 MHz) to 33 metres (1.5 MHz).

The converse also applies: it's possible to measure (indirectly) the velocity factor. If you know the length and the frequency at zero (minimum) impedance then you can calculate the velocity factor.

I suggest that you test the Analyser

with known coax types and lengths, as the internal Analyser circuitry and termination will alter the measurement. You can always use a reference length of cable. Connect the cable to be measured to the end of the reference cable using a suitable connector, then calculate the total length and subtract your reference length.

## Maths

For those who don't know or have forgotten:

$$X_c \text{ (capacitive reactance)} = 1/(2\pi fC)$$

$$X_l \text{ (inductive reactance)} = 2\pi fL$$

(where C, L and f are in Farad, Henry and Hz respectively).

Resonance occurs at the frequency where  $X_l = X_c$ .

Wavelength ( $\lambda$ ) =  $300/\text{frequency}$   
(where wavelength is in metres and frequency in MHz – a convenient shortcut)

Velocity factor = (physical length of  $\lambda/4$  transmission line)/( $\lambda/4$  in free space); or conversely,

Physical length of  $\lambda/4$  transmission line = ( $\lambda/4$  in free space) x (velocity factor).

It doesn't matter if you physically measure a quarter wavelength. You can use the calculated quarter wavelength in the above formulas, but make sure measurements and calculations use the same wavelength fraction.

Tuned circuits can be connected to the Analyser but I suggest they are only connected in series, then adjust the frequency for a minimum X. The unit can be used in normal analyser function for this measurement.

## More theory

Remember, an open quarter wavelength transmission line presents a very low impedance (short) at the opposite end (series tuned circuit). A shorted quarter wavelength transmission line presents a very high impedance (open) at the opposite end (parallel tuned circuit).

As we move back from the far end of a relatively long transmission line, an open circuit line will present a short at a distance of  $\lambda/4$ , then open at  $\lambda/2$ , then short at  $3\lambda/4$  and open at  $\lambda$ , or one wavelength, and so on. The reverse is the case for a shorted transmission line. If you are constructing traps or matching networks, always make the transmission line longer and trim until you are happy with the result.

## Let's understand efficiency

There are three matters to consider:

- What do we mean;
- What is the theoretical maximum; and
- Practical consideration.

### Definition

Efficiency in engineering is always measured as Power output / power input. With direct current [DC] we can separately measure voltage and current. But with alternating current [AC], we need to be clear that we are measuring the product of the in-phase components of voltage and current.

Other aspects of efficiency can also be considered, viz:

- Do we just measure the final PA?
- What overheads need to be operating for the final RF amplifier to be working, eg, oscillator, driver, modulator, monitoring and control circuits?
- Over what period of time is the amplifier to be ON compared with the total operating time?

### Theoretical maximum

In AC amplifiers, the maximum efficiency of Classes A, B and C depends on three factors:

- (a) That the active device is always run to just cut-off the plate/collector/drain;
- (b) That the output waveform is symmetrical, ie, there is no distortion; and
- (c) That the underlying waveforms are products of sine waves.

And because we are dealing with AC, the product of the voltage sine wave and the current sine wave will be a  $\sin^2$  wave.

Under these conditions, the maximum efficiency that can be obtained with both Classes B and C is  $\pi/4 = 78.5\%$ .

There is no point in disagreeing with this theoretical maximum unless you have a better theory. Data from experiments that arrive at different results have not met one or more of the three required conditions.

Classes D and E [and further] do not use the sine wave assumption – they use switching techniques and can get higher efficiencies, at the expense of more waveform distortion and, at RF, consequent splatter. Attenuating these splatter products is helped by using a single frequency and a very high Q antenna system.

### Practical considerations

If the grid/base/gate is not driven hard enough to cause plate/collector/drain cut off, efficiency falls in direct proportion to the square of  $([V_{cc}-V_b]/V_{cc})$ , where  $V_{cc}$  is the supply rail and  $V_b$  is the lowest achieved plate/collector/drain voltage.

In some cases, designers are too timid to run to maximum efficiency because the resultant plate/collector/drain dissipation will exceed the Safe Operating Area [SOA] of the active device. Designers may be timid because:

- they want their active devices to last forever, perhaps because they want a good image in the market place; or
- the cost of an outage, eg, to a broadcaster, in terms of lost advertising revenue and audience is too high; or
- the cost of retrieving the device to replace a failed active device is too high, eg, as in submarine cable amplifiers; or
- the skills to carry out repairs are not always available, as in an active battlefield; or
- the manufacturer's requirements for cooling to carry away the wasted heat cannot be met, eg, the finished product needs to be buttoned up so prying fingers cannot do damage or be damaged.

I suspect that some of these reasons may explain why Rodney Champness achieved such low efficiencies with his 33, 3A4 and 807. Unfortunately, Rodney doesn't tell us what the waveform was or how he measured it at what point in the PA circuit.

How did the 4CV100,000E get over the

theoretical maximum of 78.5%? Such a valve is typically used in broadcasting stations. While the condition for running to plate cut off can be achieved reliably, what many broadcasters do is to provide a disproportionate positive kick to the other end of the plate voltage excursion, resulting in what is called 'Carrier Shift'. Most people receiving a signal that has carrier shift cannot tell that the waveform is distorted – even less so with FM, where the waveform is less important than the timing of the zero-crossing points. To the accountant in the 100 kW broadcasting station that is on 168 hours per week, the difference in electricity cost is nearly \$6000 per annum.

My earlier comment about directly-heated valves having a higher efficiency than indirectly heated was based on normal radio operation, such as by mariners, travellers and radio amateurs, where typically we only talk for about 20% of the time, at most, and we cannot wait 30 seconds for the cathode to reach operating temperature – so, it was a time-based measure of efficiency that I was using. This kind of thinking was also used in the design of military radios, where the cost of having a PA tube on for a long time could not be borne by troops carrying batteries. In such designs, the final PA's filament was turned on and off by the PTT circuitry, and the speed of the directly-heated valve reaching full availability fitted the design bill. Having a carrier warming up gives an enemy time to find you and put a round through your spout.

Brian, VK2GCE

## Plan ahead

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### 2006

### 6TH AUGUST 2006

### ASHFIELD

### detail

### from

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## Technical abstracts

Peter Gibson VK3AZL

## Drilling holes in round tube

In RadCom for November 2005, Ian White, GM3SEK, in his "In Practice" column, answers a question on how to accurately drill holes in the round tube as used for Yagi booms.

His first suggestion is to use square tubing as it is much easier. However, round booms do offer slightly lower wind resistance and may be a little cheaper.

The simplest kind of drilling jig is a channel to locate the tubing, with a guide block on top that both clamps the tube as well as locates and supports the drill bit. The whole thing can be made from wood.

Figure 1 shows the construction of the jig. A strong flat piece of wood is needed for the base plate. Two strips of planed wood are used for the two sides. The thickness should be the same as the diameter of the tubing. A substantial piece of hardwood is needed for the top guide block. The method of assembly should be self evident.

Figure 2 shows the method used to enable a number of holes to be drilled in line. In this case, a spirit level is clamped to one end of the tube and the level is

checked for horizontal before each hole is drilled in line.

af

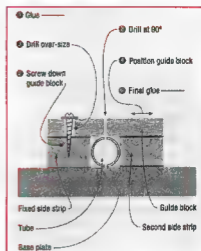


Figure 1 – Home made drilling jig for round tubing

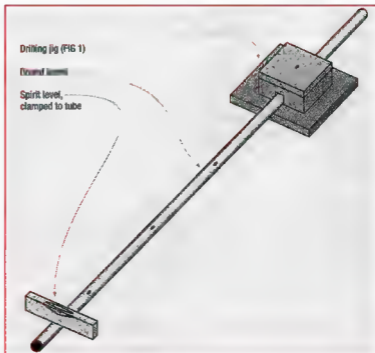


Figure 2 – Use spirit level to help drill all the holes in line

# Celebrating the Commonwealth Games on the amateur bands

Barry Robinson VK3JBR

**A month-long activation of two special event callsigns issued by ACMA for the XVIII Commonwealth Games Melbourne saw them in great demand during March this year, resulting in 10,000 contacts logged.**

Planning for this activity began 12 months earlier when Amateur Radio Victoria decided that it was essential to have a special event callsign for this highly significant event with 71 nations involved. Initial thoughts were for two callsigns, one for the Queen's Baton Relay and another for the Commonwealth Games itself.

The plan was to try and top the success of the AX3OLY special event callsign activated during the Olympic Torch Relay for the Sydney 2000 Olympic Games. David McAulay VK3EW, on behalf of WIA Victoria, put that station on air working 103 countries and receiving the ARRL Millennium DXCC Certificate.

However, for various reasons the dream of having AX3BATON on air for the 50 days of the relay throughout Australia was just not possible.

Plan 'B' kicked in with two callsigns allocated for 1-31 March. A roster of 17 members of Amateur Radio Victoria kept the callsign AX3GAMES on air most of the 30 days, while leading DXers, Peter Forbes VK3QI (CW) and David McAulay VK3EW (mostly phone) worked up a storm by sharing AX3MCG.

This turned out to be one of the most successful special event callsign activations in Australia for many years. Up to 160 countries were worked and a claim for a DXCC will be made.

Awareness of AX3GAMES and AX3MCG was high after they were mentioned in all top DX bulletins, ham radio news services including the RSGB, ARRL and WIA, with many radio societies, particularly in Commonwealth nations, alerting their members to the activity. A series of packet bulletins was also issued.

The callsigns were regularly spotted on DX Clusters and generated 4,000 look-ups on QRZ.COM as the world's



Peter VK3QJ (top) and Terry VK3UP (bottom) were amongst the team of operators who activated the AX3GAMES callsign.

radio amateurs checked out the recorded QSL details.

To help VK operators have a good opportunity of making contact with the special event stations, an alert was posted on the WIA website and mentioned on the VK1WIA broadcast. It detailed the expected times and frequencies of operation.

This worked extremely well with many expressions of appreciation being received from those who were able to use that information to score a contact.

Getting into the swing of things and working their very first special event callsign were a number of Australia's new Foundation licensees. You could hear in the tone of their voices that they were more than pleased at their achievement.

Stjepan Nikolic VK3TSN was able on one of his rostered days to operate portable at the Commonwealth Games shooting venue in Lilydale on a competition day. Stjepan concentrated on CW on that occasion and from his home QTH.

In another portable operation, Peter Forbes VK3QI and David McAulay

VK3EW went to Arthurs Seat on the Mornington Peninsula and gave many during the John Moyle Memorial Field Day Contest a surprise contact with AX3MCG.

On a number of occasions it was possible to work both AX3GAMES and AX3MCG on the same band and time, much to the delight of many who were able to score both in their logs.

The exercise involved nearly all bands from 1.8 MHz through to 1296 MHz. Various modes were also catered for with AX3GAMES appearing on the Melbourne ATV repeater VK3RTV on a week day/night courtesy David Park VK3JDA, plus some PSK31 and plenty of CW involving a number of operators. A little activity also occurred on IRLP.

In East Gippsland, Rob Ashlin VK3EK in his two day AX3GAMES log included eight different bands. Highlights were a contact with Ron ZL4RMF on 160 m, Chris Davis VK2DO mobile on 2 m using aircraft enhancement propagation, and tropospheric propagation across Bass

Strait with Joe Gelston VK7JG on both 2 m and 70 cm.

With each operator having at least an entire day it was possible for them to find a band that gave them contacts. At times when propagation was good, there were many chasing the special event stations. On one occasion, Gwen Tilson VK3DYL faced a dogpile into Europe on 20 m long-path.

Commemorative QSL cards are now being designed for both AX3GAMES and AX3MCG using Commonwealth Games images. At least two different cards for each of the callsigns are likely.

We now look forward to the prospect of another special event station on air in four years time to mark the 19th Commonwealth Games to be held in Delhi, India in 2010.

Amateur Radio Victoria thanks its members who volunteered to activate the callsigns and sincerely acknowledges the assistance from ACMA in issuing the two commemorative callsigns.

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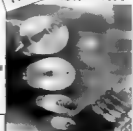


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# How I solved mobile station installation problems of my own making!

Neville Chivers VK2YO

**How did the problems come about? Well, the first problem came about when I decided that my present vehicle, like myself, was becoming a bit elderly. It was time to trade it in on a new car. But which brand?**

After doing the rounds of the dealers, and reading the literature supplied, I decided to buy a VW Golf 2 L diesel.

A test vehicle was delivered to my home QTH for a radio compatibility test. This mystified the salesman who decided to humour me. After all, a potential sale was at stake, along with his commission.

I backed up my present vehicle with HF helical attached, placed the trusty TS-680S on the front seat of the Golf, connected it to the Golf's 12 V battery and with coax cable back to the HF whip at the rear of my present vehicle, and called CQ on 40 m. More mystified looks from the salesman as he consulted his watch at odd intervals.

I explained that I needed a car with electronics that would not unduly interfere with reception and, if the test vehicle passed the test, I would order one, subject to his trade-in offer on my present vehicle which, incidentally, was a 1989 Nissan Skyline with very little interference evident on receive.

He need not have worried. The VW Golf was very quiet on receive with the motor running, the lights full on and the hazard blinkers and wipers going all at once. An order and a handshake restored his happy countenance. What about the trade-in? Yes, he agreed to what I was asking for there, too.

The car type problem was now solved. However, it was obvious there was not enough room to fit into the new vehicle the TS-680S and a separate 2 m transceiver, as there was in the old car.

Well, there was only one decision to make. Buy a new transceiver, one of those miniature marvels that cover from 'DC to daylight' in the one package, smaller than my present IC-290 2 m rig, but about the same price I paid for the Kenwood TS-680S 16 years ago!

Please don't think that I bought a

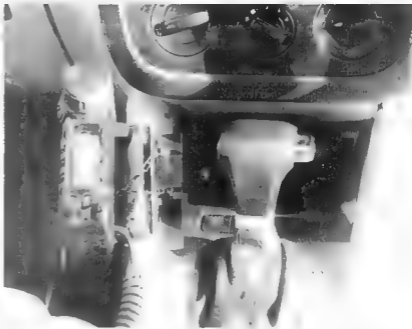


Photo 1 – FT-857D in homemade mounting bracket

new car as an excuse to buy a new transceiver. Perish the thought. It was purely circumstances!

So, which one? It came down to Icom or Yaesu, as Kenwood did not have one in this size range. After considering the IC-706MKIIG and the Yaesu FT-857D literature supplied by dealers advertising in AR, I decided on Yaesu mainly because I have had good, trouble free use from Yaesu gear over the years, right back to my first commercial HF rig, the FT-200.

The FT-857D duly arrived, along with its 128 page operating manual. A sharp learning curve here!

As the car delivery was at least three months after ordering, I had time enough to familiarise myself with the new rig in the shack. And what a 'little beauty' it is! For further details I refer you to the

excellent review of the FT-857D in the July 2005 issue of *Amateur Radio*.

In due course the VW Golf was delivered to the dealership where money changed hands and I drove it home. Habit being what it is, I indicated a turn right or left signal a few times by turning on the wipers. Being a European designed car, the indicator switch is on the opposite side of the steering column to what I am used to.

Back home I was confronted with another 100 page book on what was essential to operate the new vehicle. An even steeper learning curve was required as I had to explain all this to my co-driver wife (which I didn't have to do with the FT-857D transceiver).

Now that the two items of interest were at last at the home QTH, the next problems



Photo 2 - VHF/UHF 2 m and 70 cm J pole antenna.

inside of the console but with good clearance from the movable automatic T-bar. A small link-swaged chain passes from one side of the bracket underneath through the hand hold cut-out in the centre console and attaches to the other side of the bracket by a small padlock over the bail rest to secure the radio from opportunistic theft.

The FT-857D snug in its mount, the next problem was how to power it. It is recommended to have a dedicated pair of cables run right back to the battery terminals. That's all very well in theory. But car makers don't seem to factor the needs of radio amateurs into body design. At least VW didn't, as the motor compartment is so full right up the firewall that I could not find any grommets holes, or a place where I could drill through the firewall without drilling into something!

Normally a 'no no', the only alternative was to use the 12 V accessory socket located in the console under the dash. There is also another 12 V socket in the boot. The handbook describes their use as for charging mobile phones, laptops and a car 'fridge', so it looked like they are meant to carry a fair current.

I traced the connections of these 12 V sockets to the fuse box and found thick cable terminated in a 30 amp fuse, and heavy duty cable down to the battery adjacent to the fuse box and firewall. The distance from the battery to the fuse box to the 12 V socket inside the cabin was about half a metre. I figured that the line voltage drop should not be much and, in use, it came down to 0.3 V between receive and transmit at 100 W output from the transceiver on HF.

On to the next problem. What to do for mobile aerials? For many years I had used a home-made HF helical whip tapped for multi-band operation, along with a spring mobile mount which was offset to the left of the tow bar on a plate fixed to the tow bar by the tow ball. This allowed a

trailer to be towed without removing the spring mount.

So, this is what I used on the VW Golf. The coax runs along the cabin floor underneath the carpet between the seats and out the hatchback door. This solved the HF mobile antenna problem. Now, what about 2 m and/or 70 cm repeater operation?

On my former vehicle, for 2 m operation I had a quarter wavelength vertical on a magnetic base in the centre of the roof with the coax across the roof, through the back door and across loose to the 2 m rig. Not the ideal installation when carrying passengers! Besides, the trailing coax tended to mark the roof over a period of use.

So, I figured that, ideally, it would be nice to be able to remove the HF whip and replace it with a 2 m antenna when needed. It would use the same coax as the HF antenna so I would need to remember to change the coax from the HF socket on the FT-857D to the separate VHF/UHF socket.

But, what type of aerial to use?

After practical considerations, I

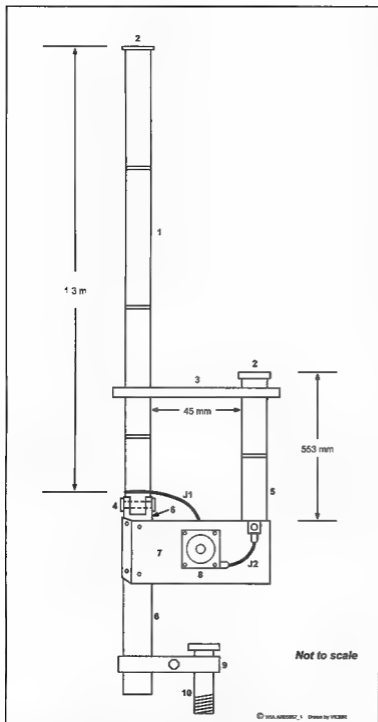


Photo 3 - HF whip with mobile mount and back stay.

to solve were how to conveniently locate the radio in the car, and to power it.

The FT-857D has a separation kit available which allows you to place the body of the radio almost anywhere in the vehicle and just have the front panel up on the dash of the car. In fact, my friend Paul VK2EX has done just that. However, as I only want to use the radio on long trips, I wanted easy but secure installation and removal. The FT-857D spends most of its time on the bench tuned to the 6 m band where its 100 W transmitter is useful, and the old faithful TS-680S is then used exclusively on HF.

The most convenient spot to mount the radio in the Golf is vertically on the passenger's side of the centre console by suspending the rig from its elevating bail rest. So, off to the metal recyclers for a rummage through their off-cuts bin. I was in luck. I found a piece of 8 mm deep aluminium U channel and a piece of 250 x 250 mm right angle extrusion which, when bolted together, forms a bracket. The bail rest of the radio slides into the U channel on top of the console, the right angle vertical face down the



when telescoped, 0.8 m. The dimensions are relevant to my installation and should only be taken as a guide, if duplicating. For me these dimensions give full power out from the Tx at 50 W in to the J-pole fed with 50 ohm coax with negligible VSWR at 146.400 MHz.

This 2 m J-pole performed very well on a recent trip to Sydney. From Kingscliff near the Queensland border, and down the Pacific Highway I accessed every repeater area I passed through and it physically stood up to prolonged air pressure at highway speeds.

Stationary at Gladesville, Sydney, I accessed several repeaters on both 2 m and 70 cm. Yes, the J-pole works quite well on 438 MHz.

But you really want to know how the 2 L diesel VW Golf went, don't you? How about 830 km in 10 hours road time, fully loaded and using only 49 L of fuel. Not bad, eh?

## Diagram legend

1. Driven element, made from two TV telescopic rabbit ears soldered together and extended to 1.3 m for operation in the centre of the 2 m FM band, ie 146.400 MHz transmit and 147.000 MHz receive.
2. Top caps.
3. Two plastic separators placed each side of 1 and 5 and bolted together to maintain separation at 45 mm.
4. Bolt locating existing tongue at the bottom of 1 in tight fitting groove cut unto the top of 6.
5. Quarter wavelength stub extending to 553 mm and tongue checked into 7. In use, the stub should be closest to the car boot.
6. Piece of insulating workable material, ie wooden dowel or fibreglass rod, etc.
7. Thick aluminium plate bolted to 6.
8. Coax socket.
9. Single bolt parallel groove clamp. If difficult to source, try your local electricity supply depot as they are used on power lines.
10. Threaded but screwed into mobile spring mount.
- J1. Wire jumper from centre pin of 8 soldered to the bottom of 1 just above the top of 6
- J2. Wire jumper between soldering lugs under bolts of 5 and 8.

decided on the J-pole as the most likely candidate. The VHF aerial had to be quickly interchangeable with the HF helical whip. As it would be about 1.3 m long for the driven element and a bit over 0.5 m for the parallel stub, the elements should be telescopic for storing in the

back of the car when not in use.

I made the J-pole out of two sets of telescopic TV rabbit ear aerials which retail at under \$5.00. I disassembled and reconstructed them as shown in the accompanying diagram. The overall length when fully extended is 1.6 m and,



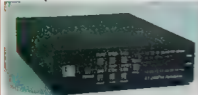
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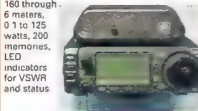
### Z11pro Auto Tuner



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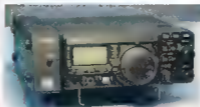


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### AT897 Auto Tuner



160 through 6 meters, 0.1 to 100 watts, 200 memories, mounts right on the side of the Yaesu FT 897

## SGC

### SGC 235 High Power Auto Tuner

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### SGC 230 Auto Tuner

160 through 10 meters, 3 to 200 watts, 170 memories, waterproof ABS enclosure.



### SGC 237 Auto Tuner

160 through 5 meters, 3 to 100 watts, 170 memories, waterproof ABS plastic covers on an anodised aluminium base.



### SGC 239 Auto Tuner

160 through 10 meters, 3 to 200 watts, 170 memories, aluminium case with exposed PCB\*



### MAC 200. Auto Tuner plus Switch

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# Redcliffe's big day out at the John Moyle Contest

Compiled by Peter Richardson (VK4TAA), with contributions by Peter (VK4TGV) and James (VK4TJF)

The John Moyle Memorial Field Day is a big event in the Redcliffe Radio Club's calendar, with planning starting immediately after the previous year's contest.

Redcliffe is roughly 20km north of Brisbane. Every year we try to think of ways to make the next year's event better. From last year's experience, we liked the location (a nearby scout camp, Murrumbong), and that we had our radio combinations, antennas and the power supply arrangements pretty right.

We had also previously learned that we needed HF filters for each band, help with calling CQ for long periods of time, easier setup and increased manning of the bands to maximise our opportunities for contacts; and we liked the idea of spotting ourselves on "clusters" to improve our contacts.

As with previous years, Andy VK4KY was the project leader for this year's John Moyle, ably assisted by Noel VK4HR, Peter VK4TGV and Glenn VK4FZ. We used our newly purchased HF filters, which worked superbly, by filtering out splatter from other bands. This allowed us to operate from just 2 tents for the 5 bands.

The weekend was supported by Wifi Laptop Interface which worked well, and



Redcliffe setting up at Murrumbong

lastly, the biggest thing that worked as planned was the voice recorders which Andy built for each station. These took the voice stress of long sessions "calling CQ" out of the weekend.

This year we were again generously supported by a local equipment hire firm (Coates Hire), to which our club is deeply grateful, with the provision of a 20 kVA generator and toilet.

Lots of preparation work occurred prior to the start, with the main staging point being at Andy's residence. People and material started assembling at the Murrumbong camp site from 10 am Friday morning and then the setting up for the contest began in earnest. We ran a 4 element mono band



(L-R) Dave VK4ZMG and Charlie VK4YZ

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# Redcliffe's big day out continued

Yagi on 20 metres, a 3 element mono band Yagi on 15 metres and 10 metres. 40 and 80 metres were supported by 2 element wire Yagis that were switchable in reverse and at 90 degrees.

This year members George VK4XY & Bevan VK4BCM, ran a small CW setup, entered separately and gave members an insight into the world of CW. (The club only entered in the phone HF part)

The weekend was a huge success. Over 30 club members attended during the contest. We made over 700 contacts on all the bands, a little down on expectations, due to the unhelpful propagation situation. It can be said with confidence that "if the contact was possible, it was worked!" A couple of our new Foundation licence operators excelled on the weekend and were hard at it working different bands

## Antenna set up

Peter VK4TGV continues with a description of the 40/80 metre beam antenna setup, which was designed and modelled by Andy.

Noel (VK4HR) and myself went 'fishing in the bush'. Noel was obviously experienced with erecting wire antennas at field days. His equipment is very simple, a surf rod with Alvey reel, fitted with heavy line and a large sinker.

The objective was to string 8 pieces of wire, 4 for the 40, and 4 for the 80 m wire beams. To get the wires to height, trees were selected, with consideration given to wire orientation and spacing.

It was quite incongruous to hear the Alvey go off in the middle of the bush and brought back memories of chasing tailor on Fraser Is. With the heavy sinker having made it over the target limb, gravity brought it back to earth - a heavier line was attached and drawn back from a hand reel over the limb. Poly-filament washing line was attached to this and drawn back over the limb using the hand-reel.

Attached to each piece of poly-filament, the dipoles were hauled up to height. Each dipole was connected to the magic switch box via a calibrated length of RG58. The length of the feedline, in conjunction with the tuning stub governed the length of each element, thereby the directivity of the wire beam. A MFJ-269 analyser was used to check the impedance at the target frequency, and also to check that the

switch box worked as expected.

The 40 m beam took about 3-4 hours to get up, which occupied most of Friday afternoon. Once up it did not take long for Andy to be set up and operating on 40.

The directivity of the beam was astonishing. By flicking a couple of switches we were able to work Europe long and short path, then swing the beam 90 degrees towards the US, again both long and short path. You couldn't wipe the smile off Andy's face, the model worked, and worked very well. The 40m array gave the club the most number of points over the 24 hours.

The 80m array was erected some distance away, considering it has to be twice as big as the 40 m array. Saturday morning Noel and I again traipsed into the bush to do some more "tree fishing".

I think I walked the 80 m dipole length 50 or so times trying to get this array high enough. After 4 hours we had the poly-filament up and ready to haul the dipoles up. But first we had to make them!

Andy's ingenuity comes to the fore with a couple of neat gadgets to manufacture the dipoles. 4 x baluns fabricated with blank PCB material, a toroid and SO-239 socket, plus some simple strain reliefs and a quantity of building wire saw us have 4 x 80 dipoles made up in an hour.

With the 4 x RG58 feedlines cut and terminated we were ready to haul this big sucker up. After some more testing and trimming Andy fired up the amplifier and Icom IC-746Pro2. The model suggested

excellent directivity as per the 40m array, but it needed to be higher to meet the model's predictions, but it worked well. Once the contest started the points began to accumulate, while we worked most of the evening into Europe and the US.

## How it all felt

Some words from James (VK4TJF).

"I like the 20 metre band because I think of it as the ham radio operator's all season, versatile DX band. Even during the current bottom of the 11 year solar cycle one can still manage to squeeze in a few hours of good DX work.

I find that the 20 metre band is also very quiet compared to other bands. 20 metres is very popular among the international amateur radio community. On my 20 metre dipole I was working many stations in Europe from Brisbane, from around 1600 to 2100 and then again at 2230 to around 0100 in the morning.

The W6EL propagation program is useful. The best way to check the band conditions is to go on air and listen. During the John Moyle Memorial Field Day contest I operated on 20 metres using a beam pointed towards Europe.

Luckily the Russian DX contest operated during the same weekend. Normally the thing to do is to call CQ on one frequency. But just by moving up and down the band I was able to contact stations calling CQ for the Russian contest. The beam and the 400 watts helped to bust through any pile-ups."



John VK4WX operating for the Redcliffe club

## John Moyle Memorial Field Day Contest

AS our members are Australia-wide, ALARA does not compete in this Contest as a club but some of us do take part. The ALARA members of AHARS were a significant proportion of the voices heard on VK5BAR, the club station.

This year three YLs picked up a microphone (my efforts did not result in any contacts, unfortunately). Tina and Leslie worked as a team over the 24 hours. Lisa, a visitor, was indoctrinated into all the activities and even made a complete contact on her own, a step towards a Foundation licence perhaps? The weather was kind, a good time was had by all and lots of contacts were made.

## Foundation Licensees.

The two daughters of Jenny Z, who often appears in these notes, have their F licences. There are several YLs with F licences in the Mount Gambier area, one being Paula with 5FOXX, and some in the North Eastern suburbs of Adelaide.

Norma's daughters are now Lorraine VK2FICQ, Michelle VK2FMYL, and Christine VK2FIZI. This makes five hams in the one house!! There are three or so associated with the Mildura Club, (I heard that on the Monday Night Net). I am sure there are many more in the other states but if they don't tell me I can't tell you.

Congratulations all, especially the YLs.

## The CLARA and WARO Contests

Conditions defeated most of us this year for these two contests. The CLARA Contest was over the same weekend as the John Moyle Memorial Field Day. I know all the YLs up there tried very hard to make contacts but didn't even hear a Canadian station.

There were a few more successes for the WARO Contest on 1st and 2nd April and at least three stations contacted the Special ZL6YL for extra points, but mostly we were disappointed. And shamefully, a few of us forgot the date.

One YL who wasn't completely disappointed was Pat VK3OZ. After trying to get through on SSB, Pat switched



Leslie recording and Tina's turn on microphone at JMMFD

to CW (her favourite mode) and managed a good contact with her sponsored YL, Sharon, ZL3AE. Pat and Sharon met on CW and have been sponsors to each other ever since. To make a Contest contact was especially satisfactory.

## The Wyong Field Day

You saw the pictures last month, now hear what really happened. The ALARA table was in front of the bar (closed). Whenever anyone cheekily asked what the girls were offering, they were given all the ALARA advertising literature and all the information about the Foundation Licence. That will teach them to be cheeky!

The day was a great success, including the Crafty Ladies Show. A lass who has a craft/material shop in Wollongong ran some craft classes. These were a roaring success by all accounts. The OMs who didn't tell their XYL about the craft classes will have to make sure they do next year or suffer the consequences.

Dot had many YL visitors, including Rosa VK2HOP, Kirsty VK2HKJ, Beryl VK2BBM, Karen VK2AKB and Sue VK2FDAY.

Dot also had a long IRLP contact with

Iris G0FIW recently. They used to hear each other frequently, so Dot can say she sounds just the same and sends her greetings to everyone. Listen out for her. You may hear her, too.

## Looking ahead

ALARA will have a new committee after the AGM. Remember you can contact any committee member with any problems, or any matters you would like the committee to consider.

Warm up for the end of August ALARA Contest by participating in the RD Contest in the middle of August. That way your gear has had a trial run first: hi! hi!

Something to look forward to if you are travelling through the Red Centre for Heritage Week in the Alice: the Morsecodians will be there. I expect they will be sending messages by code to the local mobile telephones where the messages will appear as SMS messages.

A clever idea and one guaranteed to "get every one in".

I am sure if there is a speed competition, the Morsecodians will win, too. They are amazing to watch and to hear.

# Silent Keys

## John Edward Baylis VK2JB

John's key fell silent on Tuesday morning 21st March 2006 at home in Lake Cathie. He was aged 86. John had a long and fruitful life. Born in the UK in 1919, he saw distinguished military service as a young adult in the 1st British Commando Unit both in Burma and India. John was awarded the Military Cross and was mentioned in dispatches, something he never spoke about. During the Second World War he met Joan his first wife and was married. They were together for 32 years until her tragic death. John later met Mary an Australian Nurse studying in the UK, and was again married for 32 years. John is survived by Mary and his 10 children from two marriages.

John's Army service gave him the confidence and the ability to succeed in business over many years both in the UK and Australia.

John had many interests in life and soccer and Amateur radio were just two, his favourite team was "South Hampton" and he was affectionately dubbed the original Soccer Hooligan by his friends. Amateur radio was also high on his list. John's UK callsign was G3UXX. He described his station to me in the New Forest and told me what he had achieved

on VHF and UHF with many DX contacts. On one occasion John was able to talk to astronauts in space. John was also active on HF and boasted about his antennas and copper mine, as he called it. His station was the envy of his fellow amateurs.

When John came to Australia he stayed active on radio and physically, and ran the city to surf in Sydney with some of his children, even after heart bypass surgery. John spent many of his later years in Lake Cathie, south of Port Macquarie. John was a valued member of the Oxley Region Amateur Club. His last outing with the Club was with the John Moyle Field Day on North Brother Mountain just three days before his passing.

John was a valued friend and we met on air as most of us do. I actually met John when I told him that I was making apple pie, his favourite and he had to come and sample it. John became a frequent visitor to our home and always called in on Saturday mornings for coffee and a yarn. We talked about all sorts of things. I never tired of his morning call on 2 metres to tell me the weather, and where the sun was on the tree outside his window. John had a generous nature and he gave back to life and the hobby when he could in return for

the pleasure it had given him. I felt privileged, and was one of the few to have seen this side of John.

John's health in later years declined but his zest for life continued and saw him take on some daunting challenges late in life when most would have given up.

John was very proud that his son Sam took up the Foundation Licence some weeks before he passed on, as it was always his greatest wish that one of his children would be interested enough to take up the hobby. Sam's callsign is VK2FSLB.

John's funeral was at the Port Macquarie Crematorium and was well represented by family and friends as well as the representation from the Armed Services and Amateur Radio colleagues.

John will be sadly missed by his family and valued friends.

VALE John VK2JB.

John Marriott VK2CJF



## Alan Maxwell James (McCaskill) VK4SKL/p

Alan was born in Carlton, Melbourne on 24th May 1938 to Stanley and Hilda James. After WW2 Alan's parents separated and Hilda, Alan and Alan's sister Irene moved to Tasmania. Hilda remarried and remains happily married to Bruce McCaskill. Alan was extremely fond of his stepfather and was proud to carry his stepfather's name throughout his adult and professional life.

Alan grew up and attended school in Burnie, Tasmania. On leaving school, Alan had various jobs working for the PMG and the Tasmanian railways.

In 1957, Alan met and married his only wife Jean. Together they had 3 children; Wendy, Vicki and Darren. Their marriage lasted 12 years. After the breakdown of his marriage Alan met Colleen Crout when he was working as a taxi driver. Alan moved in with Colleen and her 2 children Tania and Clint and they remained together as a family until 1978.

Between 1973 and 1978 Alan owned and operated A McCaskill Car and Caravan Transport. His first truck was a 1967 International Harvester tray back which he configured to carry 3 cars or 5 caravans with 1 caravan in tow.

Later, while working for Stowe transport, Alan bought, restored and converted a 15 year old school bus into a self contained camper van.

Alan finally left Ballarat in 1985 and began a 21 year journey of travelling and working along the east coast of Australia.

Alan's second love after his family was of course amateur radio. No matter what time of day or night Alan would be there on frequency to have a chat to anyone who would call him as well as helping out with the running of some radio nets.

In 1999 Alan was awarded the National Service Medal 1951-1972.

Alan served in the National Service

from 1956 to 1957 full time and remained enlisted part time until 1960.

Alan was diagnosed with cancer in December 2005 and passed away in Numurkah Hospital at 2.30 am, Monday 27th February 2006.

Alan is survived by his mother Hilda, stepfather Bruce, sister Irene, half brothers Edwin, Clifford, David and Kevin and his half sister Jennifer, his children Wendy, Vicki and Darren and his foster children Tania and Clint.

Vale Alan McCaskill VK4SKL/p, A NEW JOURNEY BEGINS.

Submitted on behalf of Alan's family by  
Warren Fritz VK4FJ



# Getting into (new) gear for the John Moyle Memorial Field Day

Some years ago members of the EMDRC decided it was about time to retire the old contest Yagis and build some stacked arrays on VHF/UHF.

Early in 2006 Jack VK3WWW put together two antennas and tested them in the VHF Summer Field Day. Both prototypes performed well and between January and March Jack along with Max VK3WT commenced a very involved antenna construction project. Guidelines for the system were: A pair of antennas for each mode on 2 m and 70 cm. Single coax run with masthead switching, 2 m and 70 cm to be on separate rotators.

The whole set up was to be easily transportable and assembled.

With the JMMFD rapidly approaching Max and Jack devoted most of their spare time to achieving the goal. With very little time left, Jack was able to tune up the last set of antennas and finish off the masthead relay box.

With assistance from Lionel VK3NM he was also able to test the 70 cm array and noticed that a previous SWR of 1.1-1 had risen quite considerably when the individual antennas were assembled as an array. This meant they needed to be re-tuned, this was not a real problem and only took a short time.

Friday 17th was departure day and team members departed for the contest site:

Mount Buangor QF120q located about 50 km west of Ballarat. VK3WWW arrived around 16:30 just after Victor VK3CKD and Wally VK3WDC. We erected the contest tent and managed to get on air using a VHF/UHF vertical and HF dipole. It was an early night and plenty of rest before having to assemble the station.

Saturday 18th the antennas went together well but I was concerned that we had not tested the 2 m antennas in the array configuration. This was not easy as the SWR on the FM pair was through the roof. With some fiddling we managed to get the SWR down to a reasonable 1.05:1 and got them up into the air. 70 cm went up easily but 2 m was a little trickier, as I had bought a long pole to go from the rotator to the first antenna. This pole was made from aluminium scaffolding and not easy to cut, so down came the 70 cm antenna and we cut the pipe on that one in half. Once both antennas were up in the air again Victor and Wally concentrated on 6m while I assembled the shack.

Upon connecting the antennas, I was not really impressed with the performance of the antennas for each time I peaked the Melbourne 2 m CW beacon and came out to see where the antennas were pointing they were nowhere near where they should be, it took me about one hour of working stations to realize that the 2

rotators were swapped around.

Once that was sorted out we were able to concentrate on contesting. Our troubles were not over, as about 1 km away is Lookout Hill this is the transmitting site for Ballarat TV and the front end of the IC-271 was taking a real hammering. Most of the time it was strength 5 but quite often it would hit +60 dB making it impossible to work anyone.

We persevered with the interference and worked into the night. As there were only 3 of us, VK3WWW spent most of the time on 2 m and 70 cm and VK3CKD on 6 m and HF. By early Sunday morning, VK3WWW was pretty worn out and there were no complaints when shortly after the 09:00 re-work block change, he started to dismantle the station.

The antennas did perform OK but there is a lot of room for improvement especially with matching and assembly. Over winter, with the help of VK3WT, we will rework the arrays and be ready for the VHF/UHF Spring Field Day.

Our log was way down on last year but one bonus was the use of the VK3AVV logging software. By using this to log the score most of the calculation was already done. It is the easiest JMMFD log I have transposed yet. Photos were by VK3CKD and VK3WWW.



Assembling the 2 m & 70 m antenna arrays

## John Moyle Memorial Field Day EMDRC *continued*



A home among the gum trees.

Eastern and Mountain Districts Amateur Radio Club's VHF/UHF tent and antennae working the John Moyle Field Day.

EMDRC operated from Mount Buangor, about 50km west of Ballarat.



EMDRC's 2 m / 70 cm station for the John Moyle Memorial Field Day.

The HF & 6 m station operated by EMDRC at JMMFD.  
Note the most essential piece of gear for all such days: the bug spray.



## John Moyle Memorial Field Day notes from VK5

Four amateurs operated three stations for company. We gathered at St Kilda on the coast about 30 km north of Adelaide. The location is PF95gg, 34 deg 44.74'S 138 deg 34.74'E.



Steve Mahony VK5AIM operating the Elizabeth ARC VK5LZ call sign.

The set  
up at St  
Kilda SA.  
Plenty of  
outdoors  
here.



Brenton Zerbe VK5BZ and his son Dave VK5FDBZ operated an HF station (the white car). Steve Mahony VK5AIM, who activated the Elizabeth ARC call VK5LZ, operated HF and VHF with the blue car. Colwyn Low VK5UE operated VHF from the green car. VK5LZ made 51 contacts in the 6 hours and these included a VK8 and a VK0 at Davis Base.

Aerials were a collection of dipoles and trapped dipoles and a variety of Yagis for 50, 144, 436 and 1296 MHz.

The weather was great, propagation good and we all had a good time.

Pictures from Brenton VK5BZ.

Colwyn VK5UE

## Summerland Amateur Radio Club

(Lismore) NSW)

### JMMFD CONTEST 17-19 March.

An excellent time was enjoyed by attendees. The site was great, we'll use it again. We could have done much better with help. Operators do not win contests, those contacting them do, the operators can only chase and find contacts offered. More club members offering contacts would have seen a better result. Thanks to those members who did so, especially on the successive three hour time blocks. They did a magnificent job.

We did well, but probably won't win. Results will take some time to be calculated.

The VK3 clubs are better organised with greater member participation. We'll try for more member call ins next time. Thanks to those who called in, thanks to those who attended to make it work.



SARC's set up for JMMFD. Foreground 6 m, 23 cm, 2 m vert, behind 2 m, 70 cm.

## VK2

Tim Mills VK2ZTM

E-mail to vk2wi@ozemail.com.au

The 2005/2006 AGM of the WIA (NSW Division), now trading as Amateur Radio New South Wales was held on Saturday the 22nd April. Much has already been reported by VK2WI news. There will be a follow up report in a later issue of these notes.

The AR-NSW property, Amateur Radio House, in Wigram Street, Parramatta, was sold during March 2006. Operation of AR-NSW will transfer to the VK2WI Dural site once the planned shed complex is completed, later this year. In the meantime, an office has been established in Parramatta at Suite 4, 8 Melville Street. The previous telephone 02 9689 2417, FAX 9633 1525, postal address P. O. Box 9432 Harris Park 2150 and e-mail vk2wi@ozemail.com.au have been retained. It is a small office, intended only to serve as an administration point. The former library, historic display and other member services have been packed away and placed in storage until their new home is established. Arrangements have been made to obtain accommodation for some of the former groups who met at Wigram

Street, as well as the monthly exams. VK2WI news will advise these various arrangements.

The May Trash and Treasure will be on Sunday the 28th. It will be held at VK2WI Dural and most likely followed by the Sunday Home Brew meeting. If there are any items for the next tender, it will depend upon the various moves, it will close on Friday, 12th May. The evening Home Brew meetings, on the first Tuesday of the month, will be held in Parramatta.

Next month is the regular Port Macquarie Field Day over the June long weekend and they invite you to plan ahead with the notification on page 4 of the April issue of Amateur Radio Magazine.

With so much on the go, VK2 Amateurs are encouraged to listen to the weekly VK2WI Sunday news or check out the text on the web for the current position of AR-NSW services. We could still be requiring the services of someone to assist with compiling the VK2WI news. Currently the news compiling task has fallen on Station Engineer Mark

VK2XOF who has had to curtail some of his other activities to fit it in. That is why we are asking for someone to take on the task and share the load. Generally it is an easy task where the various news sources, most of which now come via e-mail, are compiled into a printout which is either FAXed or delivered to VK2WI. This is the current practical delivery method as on site email reception remains difficult. As you will have noticed from the format there is a morning and evening version, mainly a matter of a simple edit. A copy of the complete text goes to the Web Master. It is a task which can be performed anywhere in VK2, you need computer and fax access. If you can assist, a message to the office is all you need to do. We are also still in need of an additional person for both the morning and evening transmissions as either an announcer, engineer or both. Contact the roster coordinator, John VK2JJV, if you can assist. 73 – Tim VK2ZTM.

## PORT MACQUARIE FIELD DAY WEEKEND Saturday and Sunday 10/11th June 2006

THE OXLEY REGION AMATEUR RADIO CLUB Inc.

Members of the amateur radio fraternity and anyone interested in Radio communication are invited to attend Port Macquarie's annual field day weekend, to be held on the Queen's Birthday weekend.

The venue will be the Sea Scout Hall, Buller Street, Port Macquarie, on the western side of Kooloonbung Creek, next door to the Country Comfort Motor Inn.

Saturday afternoon will be devoted to setting up the venue for the various displays, but early arrivals may wish to drop in to register early, socialize and later join us for a snack comprising a sausage or steak sandwich, can of soft drink or tea or coffee. There will be a charge of \$5 for the snack. There will be practice Fox Hunts during the afternoon

and a 2-metre talk-in Fox Hunt before the evening snack.

On Sunday there will be the remainder of the Fox Hunts, displays by leading suppliers of amateur radio equipment and of course, the usual tables of disposal equipment. There will be displays of Home Brew equipment and Computer Programs for amateur radio use.

**A BBQ lunch will be provided for all registered attendees.**

**Tea, coffee and biscuits will be provided free throughout the day and soft drinks will be available on sale at sensible prices.**

### Registration Fees

(Includes Sunday's BBQ Lunch)

OMs	\$15.00
XYLs, YLs & children 12 years and over	\$10.00

Further information from:

Club email:  
Club Web Page:

Bruce Walker VK2HOT, 02 6583 8360  
Bill Sinclair VK2ZCV, 02 6583 9302  
vk2bor@tsn.cc  
www.mypage.tsn.cc/orarc

## Tamworth Radio Club

The Tamworth Radio Club has just given donations to 2 charities. The first one was to Angel Flight and the second one was to Kootingal Rural Fire Service.

Donations to Angel Flight are used for the following:-

- 50% of pilots' fuel used while conducting Angel flights;
- specially discounted commercial flights in the event of long haul missions;
- Capital City transfers where a commercial flight is a much more economical option;
- short notice missions; or when poor weather conditions prevent light aircraft from flying;
- and the Angel Flight Australian Support Centre that runs on a very small infrastructure, with five full time Co-ordinators and a general manager as paid staff.

Angel Flight's most significant donors are the pilots, all of whom donate their skill and the bulk of their aircraft operating costs to help people in need.

The donation to the Kootingal Rural Fire Service, was in the form of a number of UHF hand held CB radios. These are used between members on the fire ground, directing traffic at motor vehicle accidents and to the helicopters and fixed wing aircraft used in water bombing of fires.

The three people in the photograph are from left: John Hams, President of the Tamworth Radio Club, Kath Pratt, Co-ordinator of Tamworth Radio Club Home Hosting, used during the Tamworth Country Music Festival and Jamie Thompson, Captain of the Kootingal Rural Fire Service.

I hope that the above donations are of interest to members.

John Fegan, VK2HUP  
Publicity Officer

**Do you have an  
event coming up?  
Let us know and we'll let  
others know**

## Angel Flight

Our sincere thanks

## Tamworth Radio Club Inc.

Your generous contribution will help fly financially and medically needy people and their compassionate carers to or from medical facilities.

Thanks to you these people will receive vital medical treatment treatment that without Angel Flight's help they may not have received. You are now part of a humanitarian group that brings hope and saves or extends the lives of people in need. Welcome to our team.

*Bill Brustow*

Bill Brustow  
Chairman

March, 2006

Date



# News from...

## VK2 continued

### Waverley Amateur Radio Society

It is now 87 years since this small but very active Sydney club was founded. Its permanent clubhouse is located on the waterfront at Vickery Avenue, Rose Bay and serves amateur radio and electronics enthusiasts living in the inner city area and southern and eastern suburbs.

The club station, VK2BV, has been rebuilt over the past year and improvements by the landlord to the premises and clubroom are continuing.

Meetings are held on the 3rd Wednesday

evening of each month. The clubhouse is also open in the afternoon of the 1st Saturday of every month, when work may be carried out to improve the club's amenities and to fix members' radio gear. Some just go along for a rag chew or to operate the club station.

This year the club's major event, the annual auction, will be held on the morning of Saturday, June 24th. All are welcome to buy or sell.

The club has held two training weekends

Simon, VK2UA

for Foundation Licences this year and all 15 candidates were successful. The next course is planned for early June and anyone interested should contact the co-ordinator Eric, VK2VE, via email to [exams@vk2bv.org](mailto:exams@vk2bv.org)

The Paddington repeaters on 2 m and 70 cms are managed by the club.

Anyone interested can find further information on all aspects of the club on its regularly updated web site at [www.vk2bv.org](http://www.vk2bv.org) or call Simon, VK2UA, on 02 9328 7141.

## VK3

### Amateur Radio Victoria News

Jim Linton VK3PC

Website: [www.amateurradio.com.au](http://www.amateurradio.com.au) Email: [arv@amateurradio.com.au](mailto:arv@amateurradio.com.au)

#### Education activity update

With the first six months of the new three-tier licence structure now behind us, we can clearly envisage a bright future in terms of growth and increased activity for amateur radio in Australia.

With the first 500 Foundation Licences issued nationally and now more than 140 in VK3 it's not hard to notice more on-air activity on the HF bands and voice repeaters.

Another positive sign is the eagerness of some Foundation Licensees to upgrade to the Standard Licence. Congratulations to Brian Sutton VK3FIMT and Damian Ayres VK3FDFA who are the first to qualify for the newly introduced Standard Licence under the assessment system.

They were keen to upgrade after getting their Foundation Licences and joined a four-week bridging course conducted by Amateur Radio Victoria. Others who attended the bridging course will do their Standard licence assessments soon.

In response to the changes that have occurred with the new licence structure, the contents and format of the Education On-line Service (Get your licence) section on the Amateur Radio Victoria website have been updated.

In addition to the popular Foundation webpage that began in October 2005, material aimed at assisting candidates for the new Standard Licence has been now included.

There are two trial Standard theory assessments and two Standard/Advanced

trial Regulations assessments. These can be attempted on-line to provide an instant result.

Those thinking of upgrading from the Foundation Licence will find it interesting to read an analysis of the new Standard theory syllabus as it relates to the Foundation licence requirements and makes a comparison with the superseded Novice theory exam.

To help those studying for the new Standard/Advanced Regulations written assessment is a set of regulations sample questions with answers, and useful links including to the ACMA's Amateur Information Paper.

#### Reminder about the AGM

The Annual General Meeting of Amateur Radio Victoria (Wireless Institute of Australia, Victorian Division) will be held on Wednesday 24 May 2006 at 8.00pm - St Michael's Hall, Victory Boulevard near the corner of High Street, Ashburton.

Members should have received the notice of meeting and annual reports. Those registered for the Members Only section of the website were sent this material via email, while others get it through the post.

#### Highlights for the year ended 31 December 2005:

- Good financial management resulted in a surplus of \$7,384
- Membership stood at 642 (and grew in the first quarter of 2006)

- Our state-wide organisation responded to the opportunities presented through the licence restructure
- A new education and assessment team is having lots of success in introducing new people to the hobby as well as providing upgrade courses
- A team of volunteers continues to deliver member services
- Activation of special call AX3ITU on ITU Day and VK3WI from the Time Ball Tower in Williamstown for the International Lighthouse/Lightships weekend

#### Repeater restorations and improvements

The Mt Big Ben 2 m repeater VK3RNE has been restored to full service. In last month's column it was explained how the Commonwealth Games had put a big demand on available rigging services, further delaying the overdue replacement of the repeater's antenna.

The new Foundation Licensees and others in the Albury-Wodonga and north-east Victoria region are now able to have a reliable repeater giving a wide coverage area.

The Mt Macedon VK3RMM UHF repeater has also been upgraded and from all reports is providing a superior service and coverage area.

## Geelong Radio And Electronics Society (GRES)

The first three months of this year again saw a diversified mix of interesting topics on our syllabus. Due to the summer holiday season, all January meetings were informal. But in February formal meetings started.

Keith VK3AFI gave members a talk on meters. This talk covered both moving coil and moving vane meters. Keith outlined the advantages and disadvantages of each type.

Barry VK3SY and Calvin VK3ZPK informed our members about the forthcoming Marconi anniversary to be celebrated in July. A special event station will operate from Queenscliff and reenact the radio contact between mainland Australia and Tasmania 100 years ago.

Robert VK3TAL gave a presentation on digital satellite television. This was

an in-depth talk and covered such topics as equipment needed for reception, the transmission mode, and the method of demodulation of the signal. He also gave us an insight into how music is recorded digitally for MP3 players.

One evening was devoted to preparation for the John Moyle Memorial Field Day. Following this evening a number of members participated in the field day for a 6-hour period. Some of our members who had never operated in a contest before took advantage of this opportunity to gain valuable operating experience. It can certainly be said that fine weather in a rural setting while operating a radio station is a very pleasant pastime.

Our Wednesday group has been active this year, and the groups numbers have grown. The group has decided that in the

Rod Green VK3AYQ

near future an audit of all our museum pieces will be undertaken. We have four cells at the Old Geelong Gaol that are packed full to overflowing with old radio and telephone equipment. Since we have many "duplicates", we will endeavour to find new homes for our surplus items. It is hoped that we can find them homes in other museums where they will be on permanent public display.

Our final formal function for March was a visit to the Ballarat Amateur Radio Group. The BARG members gave us a most enjoyable evening. We were treated to a most informative talk by Chris Long on light modulation. This was followed by supper and time to spend talking with our friends in Ballarat.

## Western and Northern Suburbs Amateur Radio Club (WANSARC)

### Michelle Ampt, VK3FAME – youngest amateur in VK

Mick Ampt VK3CH

Hot on the heels of her sister Janice VK3FIRE, younger sister Michelle, at the time only 7 years and 5 months passed the Foundation Licence exam recently and received her licence in early April.

Michelle's callsign is quite appropriately VK3FAME. She is one of WANSARC's newest members.

She is without question now Australia's youngest licensed operator, probably one of the youngest in the world, taking great delight in having displaced sister Janice, nine years then, from the spot she held for a while as VK's youngest ham.

WANSARC already has quite a few young members and given the size of our club, probably one of the highest percentages of young Foundation members in a radio club in VK. Michelle and Janice are also members of ALARA.

Both Janice and Michelle are already studying for the Standard Licence Regulations Exam.

To say their OM is pleased and proud is an understatement.

Both girls would like to thank John Weir (NERG) and Jim Linton (ARV) for tuition and examinations held.

Thanks to WANSARC members that had QSOs with Michelle as she was 'learning the ropes', Bob VK3EL in particular.

This proves beyond a doubt that any person with an interest and who puts in some time and study is able to obtain the Foundation Licence qualification, although living in an amateur radio household probably helps a bit!



On air at last, putting out a call on 146.450



It's hard to have a QSO when your Dad is pointing a camera at you! Michelle on the IC-7000

## VK4

### QSL Bureau changes

From 13 April 2006, the new VK4 Inwards QSL Bureau address is:

PO Box 1335

Maryborough QLD 4650

AUSTRALIA

Email: VK4-QSL-in@westnet.com.au

Cards and funds from the old address will be delivered to the new address, and should be processed by the end of April. Incoming cards will be processed within 30 days (usually within 7 days). For email notification of inward QSLs, just let me know your call and email address.

If you have not yet sent SASE's or postage-funds to cover the direct posting of QSLs to you, then you should do so immediately. No cheques accepted. Send

SASE's, stamps, cash, or postal money order made out to "Eddie DeYoung". All will be receipted. Receipt will be enclosed with each QSL posting.

There will be no processing charge for WIA members, only postage (and envelope if necessary) costs.

Non-WIA members may also use the VK4 inwards QSL bureau for a processing charge of \$0.05 per card, plus postage/envelope. Non-members should send AU\$10-\$20 to open a processing account. Each mailout will include a funds-balance receipt. Cards will not be sent until fee and postage is paid.

QSLs from previous personal callsigns (anywhere) will also be processed if your

**Eddie DeYoung VK4AN**  
VK4 Inwards QSL Bureau  
present VK4 callsign is on the back of the card or in the VIA box.

If you are a QSL manager for non-VK4 stations, and you wish the bureau to process them, a \$0.05 per card processing fee applies to members and non-members. The bureau is for the direct benefit of VK4 personal QSLs, so it is only fair that a small processing fee be imposed for non-VK4 cards, even those destined to a VK4 QSL manager.

Non-WIA members sending-receiving a lot of QSLs via the bureau, should seriously consider becoming a WIA member, and save the QSL processing fees! See the WIA website: <http://www.wia.org.au/> for more information.

### Redcliffe and Districts Radio Club Inc.

The very active, 70 member strong, Redcliffe Radio Club meets regularly in its own clubrooms at Macfarlane Road, Kippa Ring, 20 km north of Brisbane. With a Nominated Assessor, Assessor and certified Invigilators as members, the club regularly conduct s amateur licence exams at all levels. All licence level courses and exams have been run for a number of years. We recently saw six new Foundation Licences granted.

The clubrooms are open every Monday night from 7.30 pm, with a general meeting every second Monday, technical presentations every third Monday, and foxhunts on the fourth Monday night. The club holds "activity mornings" every second Wednesday, for those wanting to

use club facilities, or just get together.

The club's AGM for 2006 will be held on Monday 19th June. Visitors are welcome to any of these meetings. Club nets are held on Sunday evenings (7pm, 146.925 club repeater, and 3.618, 7.45 pm). All are welcome to join in. Also, we run a "trivia night" on Wednesday evenings at 7.15 pm on our 70 cm repeater, 438.325 - again, all welcome to participate, although a 50c donation to the club is requested.

The club publishes and distributes a bimonthly magazine called "QRM" to all members and interested libraries and clubs. This magazine and other information can be downloaded from: [www.qsl.com/vk4kiz](http://www.qsl.com/vk4kiz).

On the website is a 'movie' of the club's activities in the recent JM event. For more information about everything, contact the Secretary, Peter Richardson VK4TAA, email [rdc4@hotmail.com](mailto:rdc4@hotmail.com).



Peter calling for Redcliffe at the 2006 JMMFD

## VK5

### Adelaide Hills Amateur Radio Society

AHARS had a very successful Buy and Sell just before the John Moyle Memorial Field Day. As well as the usual individual sellers, there were a large number of auction lots from the estate of Denis Gneg. His widow, Ros, donated all the proceeds to the club, so at the end of the night the club had a healthy amount to add to their bank balance.

As they have done for the last seven or so years, a group of AHARS people drove to Womeroo near Swan Reach where

they erected antennas and set up battery or generator operated radio gear to simulate emergency conditions, in preparation for the Contest. John Moyle, who was instrumental in VK-land keeping 40 metres so many years ago, was very keen that all amateurs should be able to operate under emergency conditions, hence the way we all operate during the JMMFD Contest. Propagation was not very good this year as we are at the low point of the 11-year cycle, but some satisfactory

scores were obtained nevertheless. What is nearly as important is that we all had fun and were adequately fed.

All the operators on VK5BAR commented on the number of "F" calls involved in the Contest (a good sign) and remarked on the very good on-air protocol they used. It would seem to be a move in the right direction to teach new amateurs how to conduct QSOs correctly! Well done and welcome to all the new amateurs. Keep up the good work!

**Christine Taylor VK5CTY**

## VK7

Justin Giles-Clark, VK7TW

Email: vk7tw@wia.org.au Regional Web Site: reast.asn.au

### BPL Interference Watch

A second round of BPL emission measurements has been taken at the same locations and frequencies as the first round along with a number of new locations. These reports show a continuing degradation of the noise floor in the trial areas from between 15 dB (32 times greater) to 41 dB (12,600 times greater) above the measured ambient noise floor. Take a look at the REAST BPL Watch page (<http://reast.asn.au/vk7bplwatch.php>) for more information.

### Targa Tasmania

By the time you read this, Targa Tasmania, the premier Tasmanian tarmac rally will be complete for 2006. It runs state-wide from 25-30 April and this year there is a total of 43 communications operators, 20 are amateurs including eight Foundation licensees.

### Central Highlands Amateur Radio Club of Tasmania

Saturday December 2nd, 2006, has been set as the date for the VK7 Hamfest at Miena in the Central Highlands. The event will again be hosted by the CHARCT and if the last one was any indication it will be another fantastic event. Same venue and many suppliers have already shown interest. So mark this one in your diary!

### Northern Tasmanian Amateur Radio Club

March 9th was a mixed BBQ night at the Mt Barrow Visitors Centre with about 15 attendees. Tony VK7YBG, the NTARC repeater officer, reinstalled the digipeater on Mt Barrow VK7RAA and all appears to be working fine. The new antenna on Mt Arthur VK7RAB has also been installed thanks to Tony, Dick VK7DIK and Paul VK7KPG. Congratulations to Gareth Watson, Ross Broomhill, Stephen Barrett, Lyn Barnard and Bryn Warwick who all passed their Foundation Licence and are keenly awaiting their callsigns.

### North West Tasmania Amateur Radio Interest Group

The organisation for the Marconi Celebrations event from 12-16 July 2006 is coming together. The committee has received confirmation of an ARISS contact with Expedition 13 crew member Jeff Williams and Devonport High School during the event. The organising committee is also seeking any appropriate radio equipment and documentation during the event. Contact Tony VK7AX on telephone: (03) 6425 2923 or email: nwtarig@spamex.com.

David VK7DC, Dion VK7YB1, Ivan VK7XL, Tony VK7AX and Ryan Bramich made a trip to Table Cape repeater site VK7RAC and installed a new antenna and feed line for the AX25 Packet Digi on 147.575 MHz and installed the new APRS Packet Digi on 145.175.

### Radio and Electronics Association of Southern Tasmania Inc.

The weekend of the 3rd and 4th June 2006, REAST will be holding its winter field weekend at The Lea scout camp. Log fires are the order, bring your camper, caravan, tent or stay in the comfortable bunk house accommodation. The program so far includes - portable HF working, portable HF antennas, ARDF, APRS, Coax and power connectors, Rig tune ups and much more. Also included is an educative tour of the adjacent BPL trial area. The IRLP node 6710 is now located and operating from the Domain Clubrooms from

VK7RAD. APRS digipeaters are now operational on VK7RAD and VK7RHT which can hear VK7RAA in the North. The next Foundation Licence course and examination is scheduled for 20-21 May. Applications can be obtained from the REAST Web Site. Contact Reg



Ben Tucker VK7FSNP, our Antarctic Adventurer!

VK7KK on 0417 391 607 for further information.

We had 23 people along on the 5th April including visitors Jim N9GFT/VK4GFT and XYL Anne and Diane VK7ACW. The illustrated presentation was given by Ben Tucker VK7FSNP about his trip down to Antarctica in the 34 foot vessel Snow Petrel. Ben took us through the trip, the preparation, the safety aspects, the joys and the frustrations with excellent pictures and a movie. The distance is 1500 nautical miles one way in freezing conditions. Marine and amateur frequencies were employed for weather faxes and phone contacts. This was a very inspirational and fascinating presentation by a young guy with a goal and is a classic example of an ordinary person doing extraordinary things. Thanks Ben.

# Packet radio – yesterday, today ... and tomorrow?

Ray Wells VK2TV  
vk2tv@dodo.com.au

From its infancy in about 1983, the packet mode took off on a meteoric rise in popularity to reach a peak in about 1996. Since then, packet activity has slowly declined and, along with that decline, we have witnessed the demise of much of the network in VK2 (and other places) and the nation's most popular packet interest group, the Australian Amateur Packet Radio Association (AAPRA).

**What caused the decline, where is packet at now, and what lies ahead?**

Packet radio was promoted as the best thing since sliced bread, with the promise of keyboard-to-keyboard chats over hundreds of kilometres, simply by using a string of digipeaters. Up to eight, in fact, are provided for in the protocol. We were also told about the ability to easily transfer files from one computer to another over radio links.

We were probably quite naïve in believing all the hype, and went out in droves to purchase Terminal Node Controllers (TNCs) so that we could use this new mode.

The ability to successfully digipeat through more than one digipeater, let alone eight, on shared channels, falls in the same league as the possibility of finding a Leprechaun in your back garden.

The advent of hilltop nodes using networking protocols provided a glimmer of hope, in that packets were acknowledged on a per hop basis rather than from end to end, as is the case with simple digipeating. Sadly, the implementation of early network nodes left much to be desired, and they soon bogged down, mostly because of the hidden transmitter syndrome. Early network nodes were often on the same VHF frequency as end-users so, simultaneously, they were hearing both local users and adjoining nodes.

As traffic continued to increase it was realised that inter-node traffic should not be on the users' frequency, and inter-node linking was moved to UHF. This proved to be a successful next step, but it wasn't long, due to the ever increasing amounts of packet traffic, before the dreaded hidden transmitter syndrome again reared its ugly head as node A could not only hear nodes B and C on each side of it, but probably also nodes D, E, F, etc, as well, depending on node locations.

The ever-increasing amount of BBS

traffic that the nodes and network were called upon to handle only served to exacerbate the situation, to the frustration of everyone.

In fairness to those involved in those early days, TNCs were expensive, and UHF radios for inter-node links were scarce and expensive, causing "the lowest dollar value" option to be implemented in many cases.

Had UHF radios been more readily available, had duplex links (at higher speeds) been used for inter-node traffic, had users embraced higher speeds than 1200 bps to connect to their local node or BBS, things might have been different – or would they? Overseas, where those things were implemented, packet radio is probably no more popular now, as a percentage of licensed operators, than it is in Australia.

Packet radio has undergone a natural (and probably inevitable) decline as a result of many operators taking the plunge, only to find out that "it wasn't for them".

The growth of the Internet, with its ability to deliver high-speed information transfers, that has taken place over the last ten years has only served to hasten packet radio's decline in popularity, yet the internet has also helped to maintain much of the service that users expect.

Just as there were (still are?) those amateurs who refused to accept that packet radio was a bona fide radio

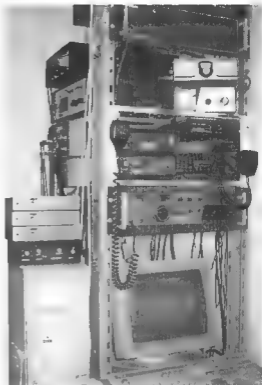


Photo 1 - in the rack, from top, DC distribution panel, 40 m then 30m SWR meters, Philips FM828s for 70 cm and 144.700 MHz, Philips FM91 for 2 m voice, TS430 for 20 m packet, then the packet monitor and keyboard. At the rear of the rack are the Tracker Lynx and Codan 6801 radios for 30 m and 40 m packet, respectively, and the 144 700/147.550 dual power meter. To the left of the rack are the MFJ1270BT TNCs for the 20 m, 40 m and 147.550 packet ports. They are sitting on the Philips FM828 for 147 550 MHz. Finally, it's the packet PC, a 300 MHz Pentium running Debian v3.0 Linux. Radio ports not served by TNCs use a Baycom USCC-4 internal four port ISA card. The station power supply is a 40 A switchmode unit from Jaycar

activity, calling it amateur computing, or other derogatory terms, so there are those now who firmly believe that using the internet to forward packet traffic is

## The Winter of Our Discontent!

Winter is back with a vengeance and I got the dreaded influenza

in mid-March, before I had taken my annual flu vaccinations. I have been indoors and naturally have been tuning via the Dxtuners website, although I have not neglected listening from my own receivers. Propagation on the higher frequencies quickly drops off as soon as it gets dark. We are still at the Sunspot minimum and it is going to be a long haul back to normality.

The German shortwave transmitting station in Jülich has been sold to Christian Voice International, which presently has senders in Chile, Zambia and Darwin. Jülich, in northwest Germany, is one of the leading transmission sites in Europe, equipped with 100 kW analogue and digital (DRM) transmitters and numerous antennas with global reach.

Under the terms of the sale, the present operators will transmit programs on behalf of clients until the end of 2007, when CVC International will take over the site for their broadcasts.

And talking of frequency switches,

Radio 3AW in Melbourne went from 1278 kHz to 693 kHz, while their music station switched to 1278. This has made it easier for me to hear 3AW in daytime as 1278 was covered in noise. Prty that Magic 693 has disappeared as it played music from my genre. 693

kHz at night is a horrible mix of the racing station in Brisbane and 3AW.

The BBC World Service is now a rolling news format, similar to that on BBC World TV. Also another major area was taken off stream with transmissions to the Caribbean and South America finishing on 26th March. There have also been reports that the BBC may be going to charge people living overseas to access Internet streaming of their programming output. UK listeners get their BBC fix as part of their receiving licence. One wonders if the dreaded licence inspectors will make sure people within Britain and Northern Ireland have paid their wireless licence to listen to BBC programs off Internet streaming.

Australia apparently has decided to permanently commence digital

audio broadcasts in 2007. The DAB or Eureka 147 system has been chosen and presumably will be in L band. I believe this will firstly start out from the capital cities and regional areas will wait longer. It is interesting that some European nations have postponed, or dropped altogether, digital broadcasts, particularly DAB. However this mode has really taken off in the UK.

The Americans have an incompatible system known as HD Radio. This uses the existing AM or FM bands with digital information being contained in the sidebands. These sidebands apparently splatter onto adjacent channels, especially with AM signals at night. This system is only operating in the US and on some Mexican stations, located close to the US border. The Canadians have opted for DAB. All of this has left the average consumer bewildered with the inevitable result that very few manufacturers have made sufficient quantities.

Recently I mentioned Radio Tashkent in Uzbekistan leaving shortwave. Apparently they have also stopped Internet streaming.

Well that is all for this month. Until next time, the very best in monitoring.

## Packet radio - yesterday, today ... and tomorrow continued

also not amateur radio. For amateurs like myself who live on a rural property, erecting towers and antennas, presents little difficulty, but our city based cousins usually aren't as lucky. Often, applying for permission to erect a tower is simply not worth the cost and time it will take, and they choose to give radio away. A goodly number of BBSs around the world now offer Telnet access via internet, thus enabling antenna-deprived amateurs the chance to still stay in touch.

And what about those nodes that were forced to close because of an unjust user-pays system? The closure of a major node in Newcastle, for this reason, had a terrible impact on the northern NSW packet network and, to this day, there is no VHF/UHF packet link between the two largest cities in NSW.

To circumvent this problem, packet has gone "full circle" with the establishment of a HF link between Sydney and

Kempsey. The link, on 40 m, is used for mail forwarding, but is also part of the dwindling Rose network that once flourished in this state.

Not only have mail links reverted to HF, increasingly end-users have also migrated to HF following the demise of local VHF/UHF systems. HF packet also provides a means of staying in touch for portable stations that might find themselves too far away from a VHF node.

Although the number of BBS stations using HF for mail forwarding is small, those stations still handle a respectable amount of mail.

A recent bulletin sent to VKNET asked who was still on packet. This drew replies from call signs that are not normally seen, those stations that are content to read mail but never, or rarely, send it. And how many other stations didn't respond at all? Are you one of them?

I'm determined to provide a service to

packet operators around the country. To this end my station has ports at 300 bps in the 20 m, 30 m and 40 m bands as well as 2 m local access at 1200 bps. All ports are available 24/7, subject to the vagaries of propagation for the HF ports.

The BBS system operates under Linux and supports the FBB BBS, FPAC (Rose), Netrom, TCP/IP (over radio only) and 'garden' variety AX25. Mail forwarding is with the following BBSs - VK5HB (Murray Bridge - 20 m), VK8DA (Darwin - 20 m), VK2PYU (Coffs Harbour - 70 cm), VK2VY (Port Macquarie - 2 m), VK2BLR (Parkes - 40 m), and VK2WI (Sydney - 40 m).

Is packet dead? Will it disappear completely? I say no to both questions. Packet radio is alive and well, and is just waiting for you to dust off that TNC and get it back into service once more.

# To Compromise or not to Compromise – that is the question

Some questions come up again and again on the AMSAT bulletin board and in other forums.

Why should I go to the trouble of mounting my pre-amplifier up at the antenna?

Is it necessary to have a non-metallic cross boom to separate circularly polarised yagis?

Is an elevation rotator really necessary if most satellite passes are less than 30 degrees elevation?

Do I really need to be able to switch from right to left if I'm using circular polarity?

Can I work the Oscars with my hand held TRX?

How far apart do I need to stack the Yagis? The book says 10 feet, would 5 feet be enough?

The list goes on and the same questions keep on coming. They are nearly all

concerned with taking short cuts. By and large people are patient and the questions generally receive polite and considered replies even though it seems like only days or weeks since the same question was posed before.

I'm often reminded of the old maritime adage, "to spoil the ship for a pen'th of tar". Or in military terms, "For want of a nail the shoe was lost, for want of the shoe the horse was lost, for want of the horse the rider was lost, for want of the rider the battle was lost".

Now it may not be that serious in the case of an amateur radio satellite station but the principle is the same. What is the sense of outlaying a lot of money on expensive antennas and "spoil the ship" for want of a little effort? Recently the last question listed above was posted on the BB and, as is often the case, one of the gurus came up with a very detailed answer.

In this case it was Franklin Antonio. Old time satellite users will remember Franklin as the original author of the ubiquitous Instant track program. He used an analogy to illustrate his points.

The question was to do with the spacing of Yagi antennas and of the effects of large lumps of metal like rotators in their fields.

Many people have trouble with the concept of the "aperture" in relation to the way that an antenna "uses" the space around it. All antennas make use of an area of space around them to couple the RF energy into the 'ether'.

Franklin urged the questioner to think of a dish of the size required to give the same gain as the Yagi on the band in question. This is a reasonable way of visualising a Yagi's aperture. No-one, he suggested would consider overlapping dishes or mounting one in front of the other or mounting a rotator in front of a dish. Everyone would agree that it's common sense to keep the 'front' of a dish clear of all obstacles.

Yet people are quite happy it seems, to overlap Yagis and put rotators, and even towers right alongside them - inside their effective apertures. He went on to give some numbers illustrating dramatically how the idea of mounting 2 m and 70 cm Yagis on a 5 foot boom with a large rotator in the middle amounted to overlapping just about everything.

His point being that you may get away with one compromise in your system, maybe even two if they aren't too blatant. But sooner or later the performance will begin to drop off noticeably if it becomes a habit.

Judging by the frequency with which these and other similar questions come up, many people are more than willing to forego the pen'th of tar and spoil the ship.

It would be interesting to compare results from two stations, one with all compromises built in and one constructed with no compromises at all?

My advice is always the same - give it your best shot.

## The AMSAT group in Australia

The National Co-ordinator of AMSAT-VK is Graham Ratcliff VK5AGR. No formal application is necessary for membership and no membership fees apply. Graham maintains an e-mail mailing list for breaking news and such things as software releases. Contact Graham if you wish to be placed on the mailing list. As a forum for members AMSAT-VK operates two monthly nets.

## AMSAT-Australia Echolink Net

The "Echolink" net meets formally on the second Sunday of each month. Anyone with an interest in Amateur Radio Satellites is welcome to join in and take part. Graham VK5AGR acts as net controller. The net starts at 0500UTC and you can join in by connecting to the AMSAT conference server.

## AMSAT-Australia HF net

The HF net meets formally on the second Sunday of each month. In winter (end of March until the end of October) the net meets on 3.685 MHz at 1000UTC with early check-ins at 0945UTC. In summer (end of October until end of March) the net meets on 7.068 MHz at 0900UTC with early check-ins at 0845UTC.

All communication regarding AMSAT-Australia matters can be addressed to:

AMSAT VK,  
9 Homer Rd,  
Clarence Park, SA. 5034

Graham's e-mail address is:  
vk5agr@amsat.org

# Set the course for Mars, Mr Sulu!

This is amazing. A little background information first.

The team at AMSAT-DL and Marburg University have two very ambitious projects on the drawing board and well underway.

One is the P3E satellite. It will fill the HEO gap left by the untimely demise of Oscar-40. The second is a more long term but nonetheless unfolding project to send an amateur spacecraft to Mars (P5A).

The P3E project will in many ways be a test bed for new ideas that will be included in P5A. The commissioning and control of a project like P5A will need something a little more capable than your average backyard amateur satellite earth-station.

IUZ Bochum are providing the facility which will be used by the Marburg and AMSAT-DL team once P5A becomes a reality. The Bochum installation features

a 20 metre dish with Cassegrain feed. A formidable antenna you'll agree and one in use already in the field of radio astronomy. Recently the team set themselves an ambitious goal and as a result the following announcement was made on the AMSAT bulletin board:

On March 31st, 2006 an AMSAT-DL IJUZ team received the American space probe VOYAGER 1 with the 20 metre antenna in Bochum. The distance was 14.7 billion km. This is a new record for AMSAT-DL and IJUZ Bochum. The received signal was clearly identified through means of Doppler shift and position in the sky. The receive frequency was exactly measured and compared with the information provided by NASA. This distance equals approximately 98 times the distance between Earth and Sun. VOYAGER 1 is the most distant object ever built by mankind. This again proves the superior performance of the Bochum antenna. Most probably this is the first time Voyager 1 has been received by radio amateurs. VOYAGER 1 was launched on 5 September 1977 by NASA. It transmitted the first close-up

pictures of Jupiter and Saturn. In 2004 VOYAGER 1 passed the Termination Shock Region, where the solar wind mixes with interstellar gas. VOYAGER 1 today is still active, measuring the interstellar magnetic field. The following radio amateurs were involved: Freddy de Guchteneire, ON6UG, James Miller, G3RUH, Hartmut Paesler, DL1YDD and Achim Vollhardt, DH2VA/HB9DUN. Special thanks to Thilo Elsner, DJ5YM of the IJUZ Bochum, Roger Ludwig of Jet Propulsion Laboratory (JPL), Pasadena USA and the Deep Space Network Tracking Station in Madrid, Spain for their cooperation.

I'm still quite blown away by this effort having recently been involved in largely unsuccessful moon-bounce experiments. I think you'll agree that the P3E/P5A team has made a remarkable achievement and it certainly proves that the Bochum facility will be up to the job of controlling the Mars probe when it comes to fruition.

More information is available on the following web sites: <http://voyager.jpl.nasa.gov> <http://www.amsat-dl.org/cms>

## Useful historical archive now available

The website of Clive G3CWF now contains an archive of Richard, G3RWL's monthly satellite news bulletins.

For twenty years, Richard prepared monthly bulletins of Amateur Radio Satellite news. They were broadcast each month in UK as part of the AMSAT-UK 80 metre net and distributed via packet radio. Many VKs will be familiar with them through that medium. Many of the early bulletins were produced prior to the internet. Clive has now obtained a complete set of these bulletins which were

originally broadcast from May 1985 to July 2004. They represent a very detailed and useful archive, especially for research and preparation of lectures.

The archive comprises 239 monthly text files, which are zipped into four packages, for convenience. Also included are some reports of the AMSAT-UK Colloquium, and reports about individual satellites. The archive may be downloaded from Clive's website at, [www.users.zetnet.co.uk/clive/satnews.htm](http://www.users.zetnet.co.uk/clive/satnews.htm)

## Moon Bounce and Oscars

This is an on-going story but I'd like to just take a little space to introduce it. Every now and then you hear claims that EME (moon-bounce) can be done with an "Oscar-class" station.

My friend Peter, VK3SO, and I decided to put this to the test some time ago. So far we've given it a pretty good go but the results are thin on the ground. We have a few more tricks up our sleeves and these will happen in the fullness of time.

We've already learned that EME cannot be hurried! I'm hoping to devote a whole

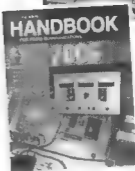
column to a report of our success or failure or maybe a separate article, depending on the size and scope of the report.

This is a way off yet so in the meantime I'd love to hear from any other Oscar operators who have given EME a good go using just their normal Oscar-class stations.

It would be nice to do a "Myth-Busters" test on this one. So please let me know of any success or failures. I'd very much like to include others' experiences in the report too.

ar

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## Awards

Mal Johnson VK6LC

# World Amateur Radio Day 2006 Award

**Amateur Radio: A gateway to information and communication technologies for today's youth.**

- 1 The WARD Award is designed to commemorate the World Amateur Radio Day celebrated by IARU on 18 April each year.
- 2 It is issued by the MK QTC, Polish Radio Amateurs' Journal, with support of PZK, Polish Amateur Radio Union.
- 3 WARD will be granted for at least the following numbers of contacts: either 10 QSOs on HF bands, or 5 QSOs on VHF bands. All contacts must be made between 00:00 and 24:00 UTC on 18 April 2006.
- 4 Send a standard application form (log extract), including the list of QSOs, to:  
The Radio Amateurs' Journal MK QTC  
Suchacz-Zamek - Wielmozy 5b  
82-340 Tolkmicko, Poland
- 5 The price of the WARD Award is USD 6 or 5 euros.
- 6 Full-colour Award, size: 210 x 297 mm.
- 7 The WARD Award is also available to SWLs for the same numbers of reports.  
<http://ward-award.prv.pl/>

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**WARD 2006**  
World Amateur Radio Day

This also certify that the Operator [blank] Radio Station [blank] has submitted evidence of two-way contacts made during the World Amateur Radio Day, 18 April 2006, and thus fulfilled the Award Rules.

Operator's name [blank]  
Radio Station [blank]  
Date of evidence, MK QTC [blank]

International Amateur Radio Union  
Since 1925, the Union of Polish Amateur Radio Enthusiasts  
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## Contest Calendar May - July 2006

May	6/7	ARI Intl. DX Contest	(CW/SSB/RTTY)
	13/14	CQ-M Intl. DX Contest	(CW/SSB)
	13	VK/trans-Tasman 80m Phone Contest	
	20/21	Baltic Contest	(CW/SSB)
	20/21	King of Spain Contest	(CW)
	27/28	CQ WW WPX Contest	(CW)
	27	VK/trans-Tasman 80 Metres CW Contest	
June	10	ANARTS WW RTTY Contest	(Digi)
	10	Portugal Day DX Contest	(SSB)
	10/11	South America CW Contest	
	10	Asia-Pacific Sprint Contest	(SSB)
	17/18	All Asian DX Contest	(CW)
	24/25	Marconi Memorial HF Contest	(CW)
July	1	Canada day Contest	(CW/SSB)
	8	VK/trans-Tasman 160 Metres Phone Contest	
	8/9	IARU HF World Championship	(CW/SSB)
	15/16	CQ WW VHF Contest	(All modes)
	15	Jack Fyles Memorial Contest	(CW/SSB)
	22	VK/trans-Tasman 160 Metres CW Contest	

Greetings to all Readers...

## The Quest for the Ideal

### Part One: Basics

We would all be aware of the new Callsigns that have appeared on our bands, so over the next few months I would like to direct my ideas primarily to these people, in the hope that they will try a contest and find some of the joy that can come from "giving numbers".

Regular readers of this column will know that I constantly urge you to keep your station at peak efficiency – for the obvious reason that you hope not to find yourself brought to an abrupt halt by a breakdown. So, having gone to the trouble of erecting antennas, it is wise to keep them in good condition.

### Basics

1. Just as much effort needs to go into setting up your operating position as goes into your station efficiency. Comfort is most important – not to the point of going to sleep when the

scoring rate slows down, but for ease of reach of everything that you need. The Quest for the Ideal Layout is never-ending in theory, but must be so in practice, and that for most of us means compromise in one way or another.

It is essential that the equipment that you need for that contest is within comfortable reach. No use if you have to reach across things to pick up your two metres or seventy centimetres microphones and run the risk of grabbing the wrong one or knocking over something else. So know what you need and arrange it within easy hand's reach.

2. Your chair must be comfortable and not put strain on your back or thigh muscles. In general I would suggest that it not be on castors in case it

should "take off" during times of busy activity (and there will be those, as well as slack times).

3. Read the rules of the contest carefully long before the event. This may seem obvious, but there are many chaps on the air who admit that they do not know what the rules require. More anon.
4. Whilst all of the above is important, yet I suggest that they are the second step in the chain of preparing for a contest (or even general shack operation).

Firstly you must decide what your interests are and which contests will best meet those needs. Traditionally contests are on the HF bands, so CW and SSB are the normal modes, but these days PSK31 and RTTY events can be found, as well as contests for

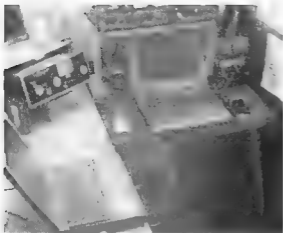


Figure 1

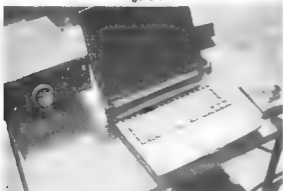


Figure 2



Figure 3

the VHF/UHF enthusiast.

Many of us, especially when we start out in the hobby, think that we must be equipped for EVERYTHING! If you are rich that's fine – if you are not, then that attitude can be a recipe for disaster and disillusionment. Better to start with HF or VHF and work outwards into modes that may become interesting to you. This will also mean that you won't have to erect a vast antenna farm – and that alone could save arguments with members of your family and neighbours.

If you will permit me a personal comment at this point – my area of interest is HF and within that the CW mode has always attracted me. (At this point please don't think "Oh the silly ... is living in the past and expects us to do likewise") I am not specially interested in SSB, preferring the better audio quality of FM. However, this does not stop me from working SSB when I have decided to do so.

Against this background I usually make an effort to submit a VHF log in contests like the John Moyle Field Day and Remembrance Day, but right from the start my attention goes to the CW bands, so the lesson is to concentrate on having as good an HF setup as I can get. I'm not rich so it has to be simple – but simple systems can still achieve much when joined with

competent operating techniques.

5. Having decided your area of interest, then plan what gear is needed for maximum participation in that interest, select an appropriate contest, then make yourself comfortable, enter the contest and enjoy it!
6. Part of your deciding has to be whether you will use computer or paper logging (more on this next month).

If you look at Fig. 1 you will see a shot of my own shack as it is currently set up.

It is not ideal and never will be because of limited space and the need to have Office and Shack in the same situation. Notice the use of laptops, simply because CRT screens cause severe hash at points across the HF bands, rendering those frequencies useless to me. Again you may think "Hell, he doesn't even know how to suppress noise". You may be right, but no matter what I do I cannot kill the hash from the colour guns in the VDU.

If you do use screens and keyboards, then they become part of the comfortable arrangement talked about earlier.

## Portable Operation

Some contests are Field Day types where we are encouraged to take our rigs and set up in an outdoor venue. Figs 2 and 3 below are ideas for such a setting

If and when you try this type of contest, the same principles discussed above apply – necessary gear and comfort. Sitting in a car is not especially comfortable, but good results can be achieved if you get out and walk every half hour or so.

## Finally

If all goes well you will have a good contest, enjoy it as you go and feel tired but happy at the end. And yet is it the end? Not quite. There is still one thing to do – send in your log! You would be amazed at how many operators here in Australia can be heard saying "I'm not in the contest, but I'll give you a number". This is self-defeating – but more on that anon.

The Manager's contact details are always in the rules of the contest, so when everything is compiled, send it off. Most contests these days have an email address for submission of logs, so if you really wanted to get it all finished at the end of the contest, you could spend an extra ten minutes preparing your entry and send it there and then. Many regular testers do that, so that it would not be unusual for a Manager to have 20 entries half an hour after the event closed.

Next month we shall look at more practicalities as well as thoughts on modern trends.

Good contesting and 73,

Ian Goddall VK3JS

## Results CQ WPX CW Contest 2005

Call	Band	Score
VK7GN	All	653,280
VK6AA	"	1,371,832
		(Op. VK2IA)
VK8AV	"	484,610
VK4TT	"	270,088
VK3KE	"	43,384
VK2BAA	"	12,932
VK4BU	14	329,085
VK6HZ	"	2,378
VK3JS/QRpp	All	1,134

NT

## Radio technology: a new way to forecast the solar max

Researchers have announced a major break-through research into forecasting solar activity and its effect on radio communications: One that could have a definite impact on ham radio and especially DXing.

The next sunspot cycle will be 30-50 per cent stronger than its predecessor and will begin as much as a year later than previous forecasts, according to scientists from the US-based National Center for Atmospheric Research. If the prediction is correct, the next solar maximum could be the most intense since the historic solar maximum of 1958.

The National Center for Atmospheric Research scientists believe they have mastered the art of accurately forecasting solar cycles. They have developed a computer model that they claim has simulated the strength of the past eight solar cycles with an accuracy of more than 98%. This amazing precision is achieved by using the subsurface movements of sunspot remnants of the previous two solar cycles to calculate the strength of the next cycle.

The Sun undergoes 11-year cycles of activity, from peak storm activity to quiet and back again, but until now there was no precise method of predicting their timing and strength. Being able to accurately predict the sun's cycles years ahead could help society prepare for periods of intense solar storms, which can disrupt communications, slow down satellite orbits and crash power systems.

Solar storms are thought to be caused by twisted magnetic fields in the Sun that suddenly snap, releasing huge amounts of energy. They usually occur near dark regions of concentrated magnetic fields known as sunspots.

Thanks to Jeremy Boot G4NJH via ARNewsline

## Canada: RAC may seek Canadian Entry Level Licence

Canada could be the next nation to go for an entry level license to entice more

young people to enter the hobby. This as Radio Amateur of Canada's Board of Directors authorises the formation of an Advisory Committee to examine whether telecommunications regulator Industry Canada should be asked to institute a new Entry Level Certificate for the Canadian Amateur Service.

The committee is under the leadership of Midwest Director BJ Madsen, VESFX. It is evaluating the very successful Foundation Licence that has been implemented in the UK and Australia. That certificate encourages young people to take an interest in science and radio to promote growth in amateur radio. The committee will also seek input from Canadian radio amateurs as to what should be done.

(RAC)

## Monaco: new allocations in Monaco

Hams in Monaco have some new ham radio allocations. According to the GB2RS News Service, effective from January 2006, the principality has allocated 1.810 to 2.000 MHz on 160 meters with 1.810 to 1.850 MHz primary exclusive and 1.850 to 2.000 MHz as secondary shared. Also now available is 6 meters from 50 to 52 MHz with 50.0 to 51.2 MHz primary exclusive to amateur radio and 51.2 to 52.0 MHz as a secondary shared allocation.

## Poland: first 10 metre beacon in Poland

The first ever 10 metre beacon in Poland is on the air. SR4TEN, was activated at 10.15 UTC on March 6th. It's located at

the office of the MK QTC Magazine in Suchacz and operates with 3 watts out on 28.203 MHz. If you receive SR4TEN please e-mail your report to qtc@post.pl.

(VHF Reflector)

## U.S.A.: Logbook Of The World now supports Worked All States Award

Users of the ARRL's *Logbook of the World* (LoTW) <http://www.arrl.org/lotw/> now may apply their LoTW credits to applications for the League's Worked All States (WAS) award. Once registered and logged in, users may set up a WAS account on the Logbook Awards page, configuring the account to automatically select QSLs to use or selecting them manually via the Your QSOs page.

LoTW is a repository of logbook records submitted by users from around the world. When both participants in a contact submit matching QSO records to LoTW, the result is an electronic "QSL" that can be used for award credit.

As part of this addition, administration and maintenance of all WAS awards is now performed using a LoTW module. US Amateur Radio licensees must be ARRL members to apply for the WAS award. In addition to WAS, LoTW supports the ARRL DX Century Club (DXCC) award.

Since its inauguration in September 2005, LoTW has more than 95 million QSO records on file, with nearly 5.15 million QSL records resulting. The system boasts just over 12,000 registered users, and there are more than 18,100 certificates - each representing a particular user call sign - on file.

(ARRL Newsletter)

## Callbook 2007

Work will be starting soon.

**Now is the time to check that ACMA has your CORRECT info.**

**We have to print the lists as they come from ACMA.  
Any other comments welcome.**

# DX - News & Views

VK40Q.

P.O. Box 7665, Toowoomba Mail Centre, QLD 4352.

E-mail john.bazley@bigpond.com

Well, I wonder how you fared with the recent DXpeditions to The Andaman Islands. It should have been relatively easy to work with the amount of activity planned and notified well in advance. There were probably quite a number of RF interaction problems that had to be solved with such activity. It will be interesting to read reports from the various groups that were there and particularly to see if this will now become an annual event.

A number of awards will be available for contacting the various operators who were active during the Hamfest at the Andaman Islands. The basic award will be issued to any station who works at least four different VU4 stations. Contacts can be made on any band/mode, starting from 18.30 UTC on 17 April until the DXpeditions are over. Full information is available at <http://www.niar.org/hamfest/awards.html>. At the time of writing 155 licensed amateurs plan to visit the Andaman Islands for the Hamfest including VK2JNA, VK8FR & VK9NS.

It is interesting to note changes in operating modes by DXpeditions. There is no doubt that RTTY is becoming more popular as DXpeditions now make a point of using that mode. The recently released QSO statistics for the 3Y0X operation show that nearly 5% of the total QSO's were on RTTY. Undoubtedly this has been facilitated by the various computer programmes available and the comparative ease to get them up and running. I see that a recent DXpedition has declared that RTTY will be the primary mode used and the main reason for going!

Are you still looking for a challenge? Then perhaps the new CQ DX Marathon, a year-long DX hunt, is what you have been looking for! Participants will compete to see who can work the greatest number of countries ("entities") and CQ zones over the course of a full year, then starting again at zero at the beginning of the next year. This year's Marathon began at 00.00 UTC on the 1st January and will end at 23 59 UTC on 31st December. A new dedicated web site has been established at [www.dxmarathon.com](http://www.dxmarathon.com) from which you can download a complete set of rules. I am sure that a lot of QSL Managers will

be pleased to see that QSLs will not be required.

Referring to QSL Managers, I do not normally give their details but since W3HNC handles so many cards I felt I should record his change of address. Effective from the 1st March, his new address will be, W3HNC - Joseph Arcure Jr, 115 Buck Run Road, Lincoln University, PA 19352, USA.

For those interested in reading accounts of DX operations the first account of the 3Y0X operation written by co-leader Ralph Fedor KOIR, appeared in a recently released edition of the TCDXA Gray Line which can be downloaded <http://www.tcdxa.org/March2006GrayLine.pdf>. This edition also reveals plans by W0GJ for his upcoming VU4 operation. For those old timers going back to the 1960's an article by KOIEA on FO8M by W9WNV will revive memories, hard to believe that was 50 years ago!

DXCC have announced accreditation of the following operations:-

3Y0X - Peter 1 Island Operation from February 8 through February 19, 2006

600N - Somalia Operation from January 18 through February 18, 2006

YI/OM2DX - Iraq Operation from July 27 through September 21, 2003

YI3SRA - Iraq Operation commencing October 3, 2003

So what have we to look forward to in May and beyond?

**PA3EXX (VK4WWI), Johan Willemsen**, is heading back to the Pacific. He plans to be QRV as P29VV from Witu Islands (OC-181) on June 16th through the 19th. Look for activity on 10, 15, 20, 30 and 40 meters on both CW and SSB. QSL info and additional information will be published on <http://home.quicknet.nl/mw/prive/willemsen/>. Johan also plans to be active from New Britain (OC-008) a few days before and after the expedition to OC-181.

**9Q - Luc ON7KEC** will be working in the Democratic Republic of Congo from early April until the end of July. He plans to operate on the amateur radio bands as 9Q/ON7KEC in his spare time. QSL via home call.

**V25V, Antigua**, will be G0VJF, Nobby, June 23-July 6. We don't yet know what bands and modes he plans to concentrate on. QSL via G4DFI direct or bureau

**N6NO, Merv**, will be celebrating 55 years of hamming and his 70th birthday from Lord Howe Island. Look for him to be QRV as VK9LNO from May 5th to 13th. He'll be 10 through 80 meters mostly CW running 100 watts and wire antennas. QSL via N6NO.

**Jersey Islands** : Look for Chris, M0DOL who will be active from Jersey (EU-013) as M0DOL/p - April 26th to May 4th.

**FP/DJ2VO (Juergen)**, plans to activate St Pierre from May 5th to May 20th operating on all bands from 80 to 10 metres using 100 watts and a vertical antenna. Further information is available at [www.qsl.net/ts7ndj2vo](http://www.qsl.net/ts7ndj2vo)

**KP2/N2IFA (Steve), KP2/KB2ENF (Steve) and KP2/KF2TI (Steve)**, will be active from 19th May until 22nd May on all bands from 160 to 10 metres. They are offering a certificate to amateurs who work all three stations (Worked all Steves!).

**AH8/W9EYE (Gavin)**, states "I will be in American Samoa in May (15th to 21st) working as a medical missionary, so this will be more of a "spare time" operation. I plan to work all HF bands on SSB as allowed by propagation. QSL please via my home call!"

**6W2/F6ELE (Fidler)**, will be operational occasionally during 9th June to 19th QSL via his home call.

**VP8/Falklands**. For readers needing a QSO with the Falkland Islands, Richard VP8DIZ, who operates on all bands is willing to make skeds via e-mail. His e-mail address is [richard.paul@interserve.co.uk](mailto:richard.paul@interserve.co.uk)

Special thanks to the authors of *The Daily DX (W3UR)* and *425 Dx News (11JQJ)* and *QTC DX PY2AA* for information appearing in this month's *DX News & Views*

For interested readers you can obtain from W3UR a free two week trial from [www.dailydx.com/order.htm](http://www.dailydx.com/order.htm).

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## Weak Signal

David Smith - VK3HZ

We're now well into autumn and, as could be expected, good propagation conditions are few and far between. However, that's not to say there are no periods of enhancement - they're just a little more difficult to find. So, it's probably a good time to go through a list of web resources that are a good source of information about band conditions. Note that this discussion applies mostly to the bands from 2 m upwards.

For general real-time information, the VK/ZL VHF-UHF Propagation Logger is proving to be very valuable - [www.vklogger.com](http://www.vklogger.com). When the bands are jumping, many people report their success (or otherwise) and many more monitor this page. At times, the list of callsigns viewing the page becomes quite long - like a flock of hungry seagulls perched on the powerlines waiting to pounce on the DX.

For those who can't continually monitor the VK/ZL Logger, then the VK-VHF mail list often has news of good band conditions - [mail.uned.edu.au/lists/cgi-bin/listinfo/vk-vhf](mailto:mail.uned.edu.au/lists/cgi-bin/listinfo/vk-vhf). Just don't mention trees.

For tropospheric enhancement, the number one site would be William Hepburn's VHF/UHF Tropospheric Ducting Forecast - [home.cogeco.ca/~dxinfo/tropo\\_aus.html](http://home.cogeco.ca/~dxinfo/tropo_aus.html). Originally developed for DX TV enthusiasts, it is quite a reliable indicator of good tropo conditions.

To verify that Hepburn is giving the right information, the Bureau of Meteorology weather radars sometimes show evidence of tropo propagation enhancement - [www.bom.gov.au/weather/radar/](http://www.bom.gov.au/weather/radar/). Look for indications of rain at long range where no clouds are shown on the satellite images. These phantom indications are often caused by reflections from mountains way beyond the normal range of the radar - received because of enhanced propagation conditions.

Even though we're near the sunspot activity minimum, there are still solar outbursts causing enhanced auroral propagation conditions. The Costello Geomagnetic Activity Index - [www.sec.noaa.gov/rpc/costello/](http://www.sec.noaa.gov/rpc/costello/) - provides a

short-term prediction of auroral activity. Another NOAA page - [www.sec.noaa.gov/pmap/pmapS.html](http://www.sec.noaa.gov/pmap/pmapS.html) - shows the current extent and position of the auroral oval in the southern hemisphere from satellite measurements.

So, bookmark these site addresses in your web browser and start looking for good conditions. They're still happening!

## UIOLI

No that's not a new digital mode, but stands for "Use It Or Lose It". Ever so slowly, our band allocations are being nibbled away and we need to be more vigilant and reactive to prevent further losses. Several recent events have affected some of our VHF/UHF/Microwave bands.

The new European competitor to the US GPS system has commenced launching satellites. Galileo will eventually have 30 satellites operational using a wide range of frequencies, including a chunk in the 23 cm band (1260 MHz to 1300 MHz). Signals from the satellites will be quite weak and spread over a wide band, so interference to amateur stations is unlikely to be significant, except perhaps for large EME setups. However, it is thought that amateurs could interfere significantly with Galileo users and considering that the 23 cm band carries the Commercial and Public Regulated services (both subscription services), then there could be some issues. More information about Galileo can be found at [www.southgatearc.org/articles/galileo.htm](http://www.southgatearc.org/articles/galileo.htm).

Working up the bands, ACMA has recently issued a proposal to vary the LPD Class Licence to allow RLAN (radio local area network) access in the 5 GHz band. The variation allows RLAN operation at a maximum level of 1 watt in the frequency band from 5.650 - 5.725 GHz. During a recent outing to a hilltop with Alan VK3XPD, we noticed digital-type interference on 5.7601 GHz that had not been heard before. Looks like the

WiFi scourge is also going to make weak signal operation on 5.7 GHz difficult, as it has for 2.4 GHz.

The ACMA proposal for varying the LPD Class Licence also will authorise the operation of ultra-wideband short-range vehicle radar in the frequency band 22 - 26.5 GHz - right over the top of our exclusive allocation at 24 - 24.05 GHz. It is unlikely that 24 GHz operators will suffer much interference, due to the extremely low power level and wide bandwidth being used. However, I hope the opposite is also true. These vehicle radars are used for intelligent cruise control, keeping vehicles a set distance apart at varying speeds. A failure caused by interference could have dire consequences.

Finally, ACMA has called for comments on a draft proposal to amend the Radiocommunications Act to allow the authorisation of devices under class licences in spectrum designated for spectrum licensing. They claim that this is needed due to the emergence of new technologies, which have low interference potential but use a wide band of frequencies, and the consequent need for these devices to be licensed across whole radiofrequency bands. This, of course, has the potential to impact all of our amateur bands and weak signal devotees will be hit hardest. Understandably, there has been a significant negative response from the telecommunications business community. Many of these companies have paid many millions of dollars for licences for their chunks of spectrum, and would be very unhappy for their frequencies to be degraded with wideband noise.

So, it pays to keep an eye on the ACMA web site - [www.acma.gov.au](http://www.acma.gov.au) - for any changes that may affect the amateur service. We should be vocal in opposing all changes that may adversely impact our hobby.

And above all, UIOLI.

Please send any Weak Signal reports to David VK3HZ at [vk3hz@wia.org.au](mailto:vk3hz@wia.org.au).

*continued next page*

# Digital DX Modes

Rex Moncur - VK7MO

The group involved in the weekend FSK441 Activity Sessions on 144.230 MHz has decided to adopt a slightly different format for the time being to accommodate interest in VK4 and VK5. The format with times in NSW/Vic local time is as follows:

## Saturdays

- 0600 to 0700 VK1/2/3/4/7 TX first period to VK5 second period
- 0700 to 0800 VK3/5/7 TX first period to VK1/2/4 second period

## Sundays

- 0600 to 0700 VK1/2/3/4/7 TX first period to VK5 second period
  - 0700 to 0800 VK1/2/3/5/7 TX first period to VK4 second period
- VK4 is currently represented by VK4WS, VK4CDI and VK4EME and VK5ZGP is representing VK5. All activity is on FSK441a now that FSK441b and FSK441c have been dropped from the latest versions of WSJT. New stations are always welcome to join the group

on 144.230 and the 40 metre callback on 7085, or nearby, after each activity session.

Congratulations to Ian VK3AXH, on getting his four x 5 λ Yagi 2 meter array operational. He is making many EME contacts on JT65, including one with a single Yagi station in the UK.

Please send any Digital DX Modes reports to Rex VK7MO at [rmoncur@bigpond.net.au](mailto:rmoncur@bigpond.net.au).

# The Magic Band - 6 m DX

Brian Cleland - VK5UBC

The bottom of the sunspot cycle certainly appears to have taken its toll on the 6 m band with there being very few TEP openings to the north. Looking at the 6 m loggers, there have only been a few reports of beacons heard or stations worked, only the occasional logging from JA stations reporting VK4TV and the northern beacons VK4RTL (Townsville), VK6RSX (Dampier) and occasionally VK8RAS (Alice Springs). Also there were only a couple of sporadic E openings in March.

On the 22nd March Trevor VK3VG Kyabram worked John VK4FNQ Charters Towers and early morning on the 23rd March there was an opening from VK5

to the Brisbane area of VK4. Wayne VK4WS worked VK5's UBC, ZK, NY & DX with Brian VK5UBC also working Allan VK4ID. Later in the morning the Townsville beacon was up to S9 in VK5. The evening of March 23rd Joe VK7JG Launceston also worked VK4ID.

Received a note from Colin VK3BE who reports that this was his first year on 6 m after 27 years and he managed to work VK1, 2, 3, 4 and ZL4LV on 16/3/06. In Colin's words "I had a ball". Well done Colin, I hope to hear you shortly.

From the 6 m loggers: on the 5th April, JA1VOK reports hearing the northern beacons and working John VK4FNQ. On the same day there was reported JA

activity into Darwin and Alice Springs. Then on the April 10, Hiro JG3LEB reports working Gary VK4ABW and Ray VK4BLK.

Noticed on the VHF-UHF propagation logger that there was mention of the Darwin 6 m beacon being reactivated shortly. This would certainly be welcome and if you have any information in regard to this please forward it to me.

With very few openings at this time of the year it is very difficult to produce 6 m notes so if you have any 6 m items of interest please remember to send them to Brian VK5UBC at [bcleland@picknawl.com.au](mailto:bcleland@picknawl.com.au).

MF

# Silent key

## Ronald Albert Hodges VK3HO

Ron passed away peacefully in his sleep on 17 January 2006 at his home in Point Lonsdale, Victoria. Ron was 94.

He was born in Merlynston, Vic, and lived there until married to Grace, when he shifted to Pascoe Vale South. Ron was an electrician at CIG during the war and after; I met him through his amateur radio activities. He built the first 40 foot self supporting tower and full size beam that I had seen, and certainly the first in the area. A good CW operator, we enjoyed lots of DX using the beam.

Ron spent a lot of time with me whilst I learnt Morse and got operating skills.

He wound all his own transformers in the rig and then a high level modulation transformer. With his home brew 10 tube Super he enjoyed the CW and phone contacts until SSB came in. By this time he had retired and moved to Point Lonsdale where he remained for the rest of his life.

Here he purchased an FT101 and vertical, which we installed on the apex of his tin roofed garage, using 100 lb nylon fishing line as the guys. This antenna was still there with the same guys when he passed away.

His love of Morse can be seen, as each

morning he would go out to the shack and listen to the shipping reports, I don't know how he got on when they stopped. At 94, he still played bowls and walked without a stick until the last couple of weeks. He suffered a heart attack in December and had a pacemaker installed. This was the final act before his daughter found him in bed on the morning of 17 January.

Ron is survived by a son, daughter and daughter in law, 4 grandchildren and 2 great grandchildren. He is sadly missed.

Allen VK3SM

# Secret Radio Communications

Dr Hank Prunckun, VK5JAZ

Spying and covert operations aren't new and neither are the methods operatives use to communicate in this shadowy world. In this article, Hank speculates on the use of wireless transmissions by terrorist agents who may be in Australia.

## Illicit Transmissions

International spying did not end when the Berlin Wall fell. Spy craft is still alive and well and flourishing in areas that have spun out of radical religious briefs as opposed to geo-political alliances. Terrorists who trained with al-Qaida and its affiliated groups have to a large extent replaced the Communist agent notorious in the spy novel. Sleeper cells awaiting word to activate or deep cover agents passing messages back to "Command" have used secret communication systems as standard operating procedure — this is well documented in the scholarly literature on espionage.

In the main, field agents have communicated using high frequency (HF) radio transmissions. Miles Copeland (1913–1991; ex-CIA officer and previously Counter-Intelligence Corps during World War II) describes this practice in some detail in his book *The Real Spy World*.

In the days before the Internet and the World Wide Web, HF radio was arguably the most, if not the only, reliable method of worldwide communication and the method least likely to be subject to interception — unlike telephone, telex or facsimile. Again, Copeland discusses why:

"Clandestine radio is also safer than is commonly supposed. Even with the most modern detection equipment, frequencies used for espionage transmissions are hard to catch — and still harder to identify for what they are because the transmissions sound like ordinary coded messages used legitimately by diplomatic and commercial concerns. Even if they come under active suspicion, by the time direction finders ("DF-ing equipment") are in place to seek the point of origin, the message is over. Naturally, the "DF-ers" listen for the next transmission, but it may be from a different place. Modern security agencies claim that they have sophisticated equipment which will

overcome these difficulties, but it simply isn't so. The airwaves are full of illicit transmissions — from China, from various parts of Russia, and from the Third World. When senders are caught it is usually as the result of tip-offs from suspicious neighbours rather than from successful DF-ing. DF-ing gets the security agents to the right general area, but that is about all." (Copeland, 1974: p.143)

## Command, this is al-Qaida/VK calling ...

In early 2005, Mr Dennis Richardson, the head of Australia's domestic counter-espionage agency — Australia Security Intelligence Organisation — announced at a legal conference that there were a number (not disclosed) of people trained as terrorists living in Australia. But because they have not committed any breach of law, there was nothing his agency or the law enforcement community could do to remove this threat from the community, he said (but later

that same year, police arrested several people on alleged terrorism charges).

Have the remaining people simply abandoned their zeal for radical religious political change and gone about their lives? Or, are these people merely lying low, planning an attack or awaiting word from Command (in whatever form Command might be) to be part of an attack? If the latter were the case, clearly these agents would need some form of secret communication: simply picking up the telephone and dialling their "controller" would not be a wise move (the DG of ASIO did not discuss whether, or how, these terrorist-trained people were being monitored, but it would be reasonable to speculate that telephone intercepts would be high on the list of collection methods).

During the Cold War, an agent might be sent into 'enemy' territory to observe and report on activities or facilities of strategic interest. While in that country, s/he would use a portable HF transceiver to send and receive messages (1). Recently declassified al-Qaida documents, which

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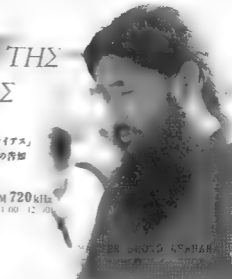


Figure 1

were seized by security agencies, confirm this situation still holds true. What is commonly called the Al-Qaida Training Manual (the formal title is: Military Studies in the Jihad Against the Tyrants) sets out the counter-measures that its covert operatives should adhere to while conducting their surveillance (Command, this is al-Qaida calling...):

...firm security measures should be taken to secure communications between the members in the country and the command outside. These measures are:

1. The duration of the transmission should not exceed five minutes in order to prevent the enemy from pinpointing the device location.
2. The device should be placed in a location with high wireless frequency, such as close to a TV station, embassies, and consulates in order to prevent the enemy from identifying its location.
3. The brother [i.e. the al-Qaida operative], using the wireless device to contact his command outside the country, should disguise his voice.

4. The time of the communication should be carefully specified.
5. The frequency should be changed from time to time.
6. The device should be moved from one location to another.
7. Do not reveal your location to the entity for which you report.
8. The conversation should be in general terms so as not to raise suspicion. (p.39)

## Shortwave Frequencies

In the case of sleeper cells, take the French Resistance in World War II. Allied forces transmitted radio messages over the shortwave frequencies (one-way night broadcasts) into Nazi occupied Europe with coded messages that were meaningful to particular Resistance cells. Coded message such as "dice are on the table," meant railway lines should be sabotaged, and "it's hot in Suez," meant telephone lines should be attacked. (see editor note) These were one-way transmissions — a French agent sitting behind a simple "crystal set" listening to

a BBC broadcast. No direction finding equipment could locate his/her presence. If, on the other hand, they were to transmit a signal, it would be possible for radio direction finding to get a fairly good fix on the area so that troops conduct a "door-knock" of the vicinity looking for the agent and his supporters.

Would terrorists use such systems now when there is ubiquitous access to the Internet? Certainly shortwave broadcasting is still popular. Many governments still sponsor stations promoting friendly propaganda about their country. There are numerous religious organisations that fund broadcasts as part of their outreach programs. There are also terrorist groups who have operated openly on the shortwave bands — for instance, the Aum Shinrikyo (Supreme Truth) which once operated from Japan (see Figure 1 — the station's QSL card which was sent to listeners). Aum Shinrikyo was responsible for the notorious poison gas attack on the Japanese subway system in 1995.

There are also the much speculated about "numbered stations" that have operated

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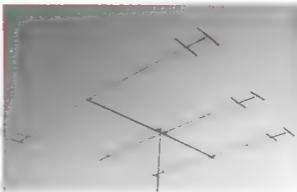
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for decades. These are the stations that suddenly appear on a frequency and in a mono-tone voice, slowly reciting what appears to be random numbers, usually in groups of five digits. There is no station identification and they vanish as suddenly as they appear. These broadcasts can be in languages other than English; Spanish is a recurrent tongue. Anyone schooled in even basic cryptography will immediately recognise five-character groups as a pattern for sending coded messages, whether simple substitution or transposition ciphers or ciphers based on complex mathematical algorithms.

## The Internet

In the age of the email, could people who have trained as terrorists still use converted radio equipment as a realistic method of communication? What is the likelihood that this mode of communication might have in relation to others?

There are many ways to communicate: by telephone, facsimile, telex, and the

Internet (e.g. email, IRC, websites, FTP, etc.). Telephony can take the form of several modes including landline, mobile, and satellite. However, interception of any of these forms of communication is relatively easy for law enforcement agencies, and when a listening device is installed, it is impossible for any counter-surveillance "sweep" to detect it. Therefore secret radio communications is an option.

## Radio Spy Craft

What would be required to communicate via radio between Australia and a terrorist's base of operations overseas as outlined in the Al-Qaida Training Manual?

The initial response is an HF signal. Frequencies above 30 MHz would not be able to communicate beyond a few hundred kilometres (though communication has been established over several thousand kilometres — for instance, stations in Adelaide and Hawaii have made contact, a distance of some

9,000km — but this is an extraordinary occurrence). If the criterion "reliable" is added to the descriptor "worldwide," then frequencies between the 40 m and 15 m bands are the obvious choices.

In fact, frequencies in the various sub-bands within this range would be essential depending on solar activity and the condition of the D, E and F layers of the ionosphere, amongst other factors. For example, the optimum frequency to different parts of the world varies not only season-by-season, but hour-by-hour at different points on the earth. An operator here in Australia would have to consult propagation charts to assess which frequency is best for that time of day.

Accessing this range of frequencies is not difficult, nor is calculating the lowest and maximum usable frequencies a complicated task. Most HF transceivers come standard with transmit and receive functions between 160 m (1.8 MHz) and 10 m (29 MHz). Commercial radios can operate in AM, FM and single sideband

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(LSB and USB) modes as well as the classic Morse code (CW). They can also be used in digital modes such as RTTY and PSK. Power output can be from a few watts to a few hundred watts, with worldwide coverage obtainable (reliably) with as little as 100 watts. (In fact, the current system of globally positioned HF beacons on 14.100 MHz enables a terrorist to determine the best frequency to transmit their low-powered signal.)

These radios are about the size of a notebook computer, but require an antenna that is much larger than the home television antenna. If reliable worldwide communication is required, then a simple strand of wire antenna is needed, and probably, a directional antenna with some gain (e.g. two or three element Yagi).

Big antennas are a serious drawback. Many Australian radio operators have made overseas contacts using a random length of wire strung around the radio room, but these are aberrations and could never be considered reliable for worldwide communications.

A random wire or loaded dipole configuration could be installed in the roof space of a suburban home, or disguised amongst trees on a rural homestead, and then used for interstate communications on, say, the 80 m band (but only at night due to the limits imposed by the physics of electro-magnetic propagation characteristic of this frequency). It is safe to say a hidden antenna system like this couldn't be used reliably for communications overseas.

So, could terrorists still use radio equipment as a realistic method of communication?

HF would appear not to be the medium of first choice. The image of WWII secret agents operating from Nazi Occupied Europe, although intriguing, can be discounted — they were operating from distances of several hundred miles, not tens of thousands of kilometres.

Does that mean that radio is out as a system of covert communications? No, not at all — it is always possible to rig-up a system that can be disguised (Many amateurs in retirement villages and apartments do (note 2). And there is still radio communications via satellite!

Even though line of sight VHF and UHF communications can be ruled out, they can be used reliably to make contacts via low earth orbit satellites (As opposed to satellites operating beyond a few hundred kilometres above the earth that require high gain antennas, high power

transceivers and the like. These high gain antennas would call immediate attention to the user). For instance, I once had a 145 MHz contact with Astronaut Dr Andy Thomas while he was aboard the Russian Mir Space Station and worked Mir's on-board packet radio station in digital mode. Although short, my voice contact was a true "five-by-nine" and the packet contact went perfectly and was long enough to pass a message entered directly from my computer keyboard. Certainly the overpass of a low earth orbit satellite is long enough for two hypothetical terrorist agents to exchange instructions and make reports as to progress (recall that the Al-Qaida Training Manual says voice transmissions should be limited to five minutes). It only takes a garden-variety VHF radio and a UHF radio combination (or a combination of a VHF radio and a UHF scanner, or some such arrangement) and a vertical antenna smaller than a TV antenna. (note 3)

The only limitation with this is the footprint of the satellite — several hundred to a thousand kilometres — far enough to reach Indonesia from the Northern Territory or some other northern part of the country (but unlikely in places like Tasmania/VK7).

But then again, if it was only Indonesia that needed to be reached, an HF radio and a wire antenna is all that might be required, not VHF/UHF satellite. Having said that, it is possible for a relay station to be located in a nearby country, such as Indonesia, and handle the radio traffic for terrorist agents in Australia. But this scenario then presents the problems of increased likelihood of interception with all the dangers that the Allied clandestine radio operators faced during the Second World War, as well as throughout the Cold War.

## Conclusion

So, what is the likelihood that terrorist operatives might be using radio as a means of communication? Well, it is certainly possible. The Al-Qaida Training Manual specifically discusses secret radio communications as a method approved for use by its operatives.

As for the threat posed by these operatives — it too is real. There are international groups in addition to al-Qaida (e.g. Jemaah Islamiyah) that have publicly expressed their desire to cause great harm to Australia — this forms intent. We also know from information

in the public domain that these groups have access to resources and knowledge which would facilitate them carrying out an attack — this forms capability.

Together, intent and capability establishes a threat. How great is this threat to Australia? Well, that is no doubt a classified secret to which only a few government intelligence and enforcement agencies would be privy. Regardless, recent news stories give use some sense of the risk posed by this threat.

Is there a role for amateur radio operators and short wave listeners in the War-on-Terror? I think so. Recall the Australian Government's national security campaign to "Help Protect Australia from Terrorism." This campaign has a website ([www.nationalsecurity.gov.au](http://www.nationalsecurity.gov.au)) and toll free telephone number (1800 123 400) for members of the public who have "small pieces of information..." to pass on ("Be alert, not alarmed").

Radio traffic between stations that bear the hallmarks of a covert terrorist operation could help police and security agencies foil a plot, or help them track down those who have been involved in previous attacks. Remember what Copeland said: "When senders are caught it is usually as the result of tip-offs from suspicious neighbours rather than from successful DF-ing" (p.143). Copeland also stated that "ham radio messages" are a known means of disguising these illicit communications (p.144).

Clearly spy craft is as alive today as it has always been, and terrorist operatives are no doubt using these techniques to threaten Australia's sovereignty. Every piece of information helps secure Australia against foreign threats and amateur radio operators, as well as shortwave listeners can play a role in helping to protect Australia from terrorism.

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- Al-Qa'ida (ND). Military Studies in the Jihad Against the Tyrants (informally known as the Al-Qaida Training Manual) London
- Miles Copland (1974). The Real Spy World. London: Weidenfeld and Nicolson.
- Dr Hank Prunckun is a research criminologist specialising in the study of transnational crime — including terrorism. In addition, he holds an Advanced amateur radio operator's licence (VK5JAZ) and a marine VHF radio operator's

licence. He has been awarded the DXCC by the Wireless Institute of Australia for his work in the HF part of the spectrum.

## Over to you

### Broadband over Power Lines

#### Notes

1. Morse code was most likely the mode of modulation as this type of transceiver can be much smaller than one that operates by way of radiotelephony. Transporting and concealing a radio transceiver would be highly desirable to avoid attention of the authorities. Also, Morse code insured that no voice recording could be made by the intercepting station that could be later used as evidence. These counter-measures are well noted in the Al-Qaida Training Manual.

2. I once worked a VK amateur station in New South Wales on 80 m HF who had loaded-up his galvanised roof guttering which became his antenna. He claimed to get an SWR of 1:1 through his ATU and my log shows he was a five-by-nine signal at my QTH in VK5. His antenna would have been completely "invisible" to his neighbours — there would have been no obvious sign of him operating a radio station at all. Nevertheless, this type of system would be very difficult to explain to police if the operator was a suspected terrorist operative and it is not an easy system to disassemble in a hurry if a police raid is imminent.

3. With satellite communications, a covert operative could hypothetically operate from a car using a dual-band — 2 m and 70 cm — antenna mounted on the roof and drive from location to location. This set-up would not attract suspicion as mobile radios are omnipresent, especially amongst the 4-wheel drive community. No one would know that the operator was communicating through a satellite would simply take him/her for a CBer chatting with their "buddy."

I have held my licence and call sign continuously since 1947. During that time I have observed threats to the very existence of Amateur Radio, but none has worried me more than that of BPL.

Having worked in radio broadcasting in the Post Master General's department for many years, I and most radio amateurs are well aware that BPL is a very bad technology. Big corporations want to make it a reality regardless of what other forms of communications will be disrupted.

Once established, they will not just draw the line at 90 MHz of the spectrum. When that section is saturated they will simply apply for more. They see only profit — nothing else matters. Amateur Radio, essential services and the military will all be affected eventually, once it is allowed to be established. Then it will be too late to change it.

Where BPL is being trialled it is

being demonstrated that interference is widespread. That will surely engender complaints by BPL users and their providers into the media and to the attention of ACMA to hopefully bring about a debate and inform the general public just what a poor technology BPL is.

If it gets a toe hold, it will spread like wild fire and ACMA will come under political pressure to look the other way and allow licensing of BPL. The potential to make profits is reason enough to drown all else in its path regardless of all its undesirable consequences.

My belief is the WIA should urge ACMA and members of parliament to object to the introduction of BPL.

We should inform the general public, politicians and other officials as to just what havoc it will bring to all radio communication.

Peter VK4PO

### CW on VHF/UHF Repeaters?

It seems odd that some VHF and UHF repeater IDs are still transmitted using Morse Code rather than using a pre-recorded or synthesized voice. Recent developments in Australian amateur licensing have seen the Morse requirement abandoned all together.

Therefore, as there is now a growing number of amateur operators who do not have Morse as a skill, it seems pointless that such an ID system still operates. It could be argued that a large number of repeater users (perhaps the majority?)

have no idea what these dits-and-dahs mean and therefore a Morse ID serves little utility. One could even say that it was always odd that Morse was used for repeater IDs because there was no requirement for Morse proficiency testing above 30 MHz.

So, is the time right for repeater owners and operators to change over to voice IDs? The answer seems clear to me...

Hank VK5JAZ

## Silent key

### Tim Chen, BV2A, founder of CTARL

Our Charter President Tim Chen, BV2A, passed away at the Taipei Veterans General Hospital on 22nd February 2006, aged 92 years. Tim founded the first amateur station of BV.

Tim was admitted to the intensive care unit on the eve of Chinese New Year, 28th January, due to the deterioration of his condition (colon cancer). He was due to be transferred to a hospice for further care but passed away before this occurred.

His family members were present at the time.

The funeral took place on 28th February at the Hwai-Yuan Hall, Taipei Veterans General Hospital in Shuhpai, Taipei.

You may send messages to bv2a@ctarl.org.tw. The HQ of CTARL (Chinese Taipei Amateur Radio League) will forward the messages to Tim's family.

CTARL 25th February 2006  
Bolon Lin, M.D., BV5AF

#### Editor's Note

Probably the most famous of the one way coded messages was "Blessent mon cœur d'une langueur monotone" (wound my heart with a monotonous languor). This indicated that D-Day had arrived. The Resistance immediately undertook major sabotage of German communications and transport.

# Adelaide-Auckland

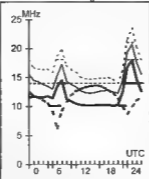
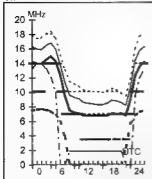
104

# Brisbane-London

327

second 2F12-15 2E Short 3241 km

First F 0-5 Long 23498 km

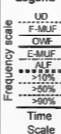


May

2006

T index: 15

Legend



# HF Predictions

by Evan Jarman VK3ANI

34 Alandale Court Blackburn Vic 3130

These graphs show the predicted diurnal variation of key frequencies for the nominated circuits. These frequencies as identified in the legend are:-

- Upper Decile (F-layer)
- F-layer Maximum Usable Frequency
- E-layer Maximum Usable Frequency
- Optimum Working Frequency (F-layer)
- Absorption Limiting Frequency (D region)

Shown hourly are the highest frequency amateur bands in ranges between these key frequencies, when usable. The path, propagation mode and Australian terminal bearing are also given for each circuit.

These predictions were made with the Ionospheric Prediction Service program: ASAPS Version 4

# Adelaide-Cairo

288

# Brisbane-London

327

# Canberra-Moscow

317

# Darwin-Manila

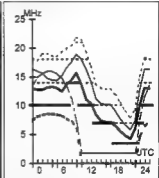
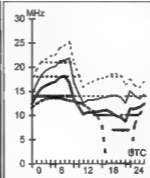
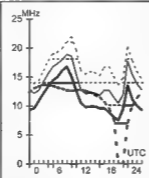
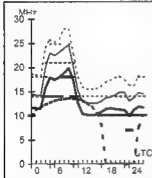
340

First F 0-5 Short 13332 km

First F 0-5 Short 16526 km

First F 0-5 Short 14481 km

Second 4F7-14 4E0 Short 3196 km



# Adelaide-Honolulu

57

# Brisbane-Ottawa

303

# Canberra-New Delhi

303

# Darwin-Santiago

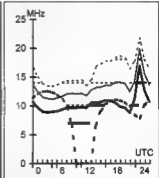
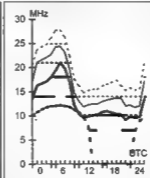
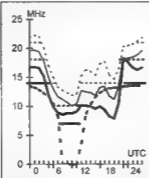
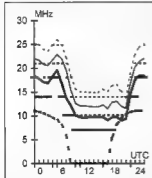
167

Second 4F6-10 4E0 Short 9160 km

First F 0-5 Short 15308 km

Second 4F4-8 4E0 Short 10347 km

First F 0-5 Short 14422 km



# Adelaide-New York

67

# Brisbane-Tokyo

348

# Canberra-Seattle

48

# Darwin-Seoul

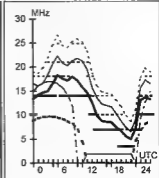
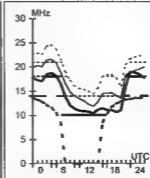
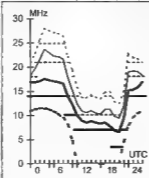
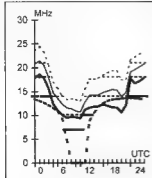
355

First F 0-5 Short 17092 km

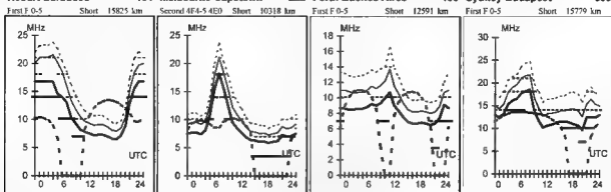
Second 3F6-10 3E0 Short 7159 km

First F 0-5 Short 12709 km

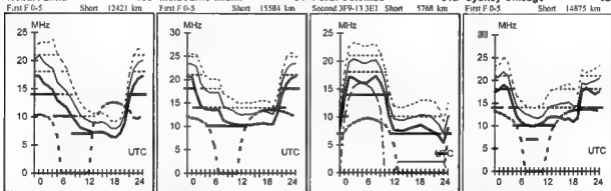
Second 3F10-16 3E Short 9575 km



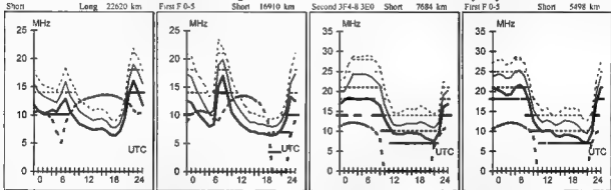
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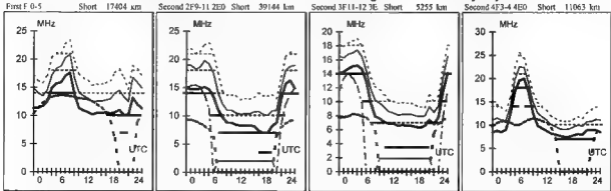
**Hobart-Lima** 133 **Melbourne-Miami** 94 **Perth-Colombo** 312 **Sydney-Chicago** 62



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**Hobart-London** 303 **Melbourne-Suva** 65 **Perth-Wellington** 119 **Sydney-Pretoria** 230



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- ICOM IC-706 MKII HF/VHF transceiver, excellent condit, with 240 volt KENWOOD p/supply, EAT-300 manual ant tuner, all options, portable cables etc \$1350 ono. Doug VK2DDR. Contact Greg 0419 243 927

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and copy of FT530 Operator's Quick Reference Card. Errol Trimmingham VK2BET email errol.trimmingham@bigpond.com, phone 02 9476 2933

## WANTED VIC

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- Tuning heads for RDO receiver, labelled TN-2B serial number #190, TN 3B serial number #224. I am looking for these tuning heads because I have the calibration charts for them. Phone Brad 03 9873 7127

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<b>VK1 Australian Capital Territory</b> VK1WX Alan Hawes VK1ZPL Phil Longworth VK1ET John Wociner VK1GH Gil Hughes	<a href="mailto:vk1advisory@wia.org.au">vk1advisory@wia.org.au</a>	Sundays at 11.00 am VK1WIA 7.128, 146.950, 438.050 Canberra Region Amateur Radio Club Email newsletter will be sent on request to <a href="mailto:president@vk1.ampr.org">president@vk1.ampr.org</a>
<b>VK2 New South Wales</b> VK2QV Chris Flak VK2XCD Chris Devery VK2BFN Adrian Clout	Phone 02 9689 2417 <a href="mailto:vk2wi@ozemail.com.au">vk2wi@ozemail.com.au</a> <a href="mailto:vk2advisory@wia.org.au">vk2advisory@wia.org.au</a>	VK2WI - Sunday 1000 and 1930 hours local. 1.845; 3.595; 7.148; 10.125; 14.170; 28.320, 52.525; 145.600; 147.000; 438.525; 1273.500 megahertz. Plus regional relays. VK1WIA news included in the morning
<b>VK3 Victoria</b> VK3JB John Brown VK3GP Jim Linton VK3APO Peter Mill	Phone 03 9885 9261 <a href="mailto:arv@amateurradio.com.au">arv@amateurradio.com.au</a>	VK1WIA, Sunday 11am and 8pm, 3.615 and 7.085 (LSB), 10.130 (USB), VK3RML 146.700, VK3RMM 147.250, VK3RMU 438.075.
<b>VK4 Queensland</b> VK4BY Don Wilchefski VK4ZZ Gavin Reibelt VK4KF Ken Fuller	Phone 07 3221 9377 <a href="mailto:vk4advisory@wia.org.au">vk4advisory@wia.org.au</a>	VK1WIA, Sunday 9.0am via HF and major VHF/UHF rpters
<b>VK5 South Australia and Northern Territory</b> VK5OV David Box VK5APR Peter Reichelt VK5ATQ Trevor Quick	Phone 08 8294 2992 <a href="mailto:boxesdnm@im.net.au">boxesdnm@im.net.au</a> <a href="mailto:peter.reichelt@bigpond.com">peter.reichelt@bigpond.com</a> <a href="mailto:vk5advisory@wia.org.au">vk5advisory@wia.org.au</a>	VK5WI: 1843 kHz AM. 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.800 FM Mildura, 146.900 FM South East, 146.925 FM Central North, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 LSB, 7.065 LSB, 10.125 USB, 146.700 FM, 0900 hrs Sunday. The repeat of the broadcast occurs Monday Nights at 1930hrs on 3585kHz and 146.675 MHz FM. The broadcast is available in 'Realaudio' format from the website at <a href="http://www.sant.wia.org.au">www.sant.wia.org.au</a> Broadcast Page area.
<b>VK6 Western Australia</b> VK6NE Nail Penfold VK6XV Roy Watkins VK6OO Bruce Hedland-Thomas	Phone 08 9351 8873 <a href="http://www.vk6.net/">http://www.vk6.net/</a> <a href="mailto:vk6advisory@wia.org.au">vk6advisory@wia.org.au</a> <a href="mailto:vk6ne@upnaway.com">vk6ne@upnaway.com</a> <a href="mailto:vk6xv@bigpond.net.au">vk6xv@bigpond.net.au</a>	VK6WIA: 146.700 FM(R) Perth at 0930hrs Sunday relayed on 1.865, 3.564, 7.075, 10.125, 14.116, 14.175, 21.185, 29.120 FM, 50.150 and 438.525 MHz, Country relays 3.582, 147.200 (R) Catalay, 147.350 (R) Busselton, 146.900 (R) Mt William (Bunbury), 147.000 (R) Katanning and 147.250 (R) Mt Saddleback. Broadcast repeated on 146.700 at 1900 hrs Sunday relayed on 1.865, 3.564 and 438.525 MHz : country relays on 146.900, 147.000, 147.200, 147.250 and 147.350 MHz. Also in "Realaudio" format from the VK6 WIA website
<b>VK7 Tasmania</b> VK7ZAX Phil Corby VK7DG Dale Barnes VK7KK Reg Emmett	Phone 03 6234 3553 <a href="mailto:vk7advisory@wia.org.au">vk7advisory@wia.org.au</a> <a href="mailto:phil.corby@tassie.net.au">phil.corby@tassie.net.au</a> <a href="mailto:vk7dg@wia.org.au">vk7dg@wia.org.au</a> <a href="mailto:regemm@ozemail.com.au">regemm@ozemail.com.au</a>	VK1WIA Sunday 9am on VK7WI network: 3.570MHz LSB, 146.700 MHz FM (VK7RHT South), 53.825MHz FM (VK7RAD South), 147.000MHz FM (VK7RAA North), 146.750 FM & 53.825MHz (VK7RNW North West), 146.625 MHz FM (VK7RND North West), UHF CB Channel 15 (Hobart) and 27MHz CB - 27.225MHz LSB (Hobart). Followed at 9:30am with VK7 Regional News Broadcast also on 7.090MHz LSB & 14.130MHz USB

### Notes

1. Only three members of the state advisory committees are listed.
2. All listings are preliminary. They will be updated each month as required.
3. Membership application forms are available from the WIA web site [www.wia.org.au](http://www.wia.org.au) or the national office address above.

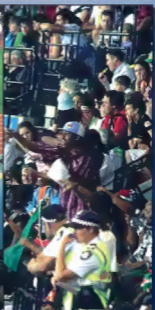
# GAMES QSLs



## Commonwealth Games QSL cards.

These cards are drafts showing the style to be used for the QSL cards for the commemorative callsigns. The cards will be doubled sided with full colour images adorning the front, the back will explain the special event callsigns and space for the contact details.

At least two and possibly four different cards will be printed for each callsign



*see more  
pictures  
and story  
on page 23*

# ICOM's price break through

most affordable prices ever



## IC-7000

**HF/VHF/UHF All mode Transceiver** • 100W HF/50MHz, 50W/2m, 35W/70cm • LF DSP for improved noise rejection • Digital IF filter for Dial up selectivity • 2.5" TFT colour display for bright easy reading • Remote control DTMF Mic for fingertip control & IRLP access PLUS • digital voice storage • 2 mode band scope • Multi function meter 7 SWR display • Built in RTTY modulator



## IC-756PRO III

**HF\*6m** • Sharp & soft IF filter shape • New receiver gives +30dBm third-order intercept point • One-touch record/play • Digital voice memory • Extended 1/4 Tuning step & BPF functions for SSB-D mode • 32-bit floating-point DSP and 24-bit AD/DA converter • SSB/CW synchronous tuning • 5-inch color TFT LCD • Built-in antenna tuner • Customisable filter shape • No optional filters to buy



## IC-7800

**HF\*6m** • Four 32-bit floating point DSP units • +40dBm ultra high intercept point • Automatic tracking pre-selector • Two completely independent receiver circuits • 200W output power at full duty • Ultra high frequency stability • 7-inch wide color TFT LCD • Multi function spectrum scope • RTTY / PSK31 operation without PC connection • Professional 6m receiver • Digital Voice Recorder • CF memory card.



## IC-2200H

• VHF-High (65W) Power Output • DTCS & CTCSS Tone Squelch • DTMF Encode & Decode (with optional UT108) • Digital Voice & Data Communication (with optional UT118) • 207 Alphanumeric Memories

## IC-P7A

**VHF/UHF (2m/70cm) Dual-band FM Handheld Transceiver** • Ultra compact body, light weight 47x81x28mm, 160g • Mini-power VHF/UHF dual bander with wideband receiver 0.495-999.990MHz • 1800mAh large capacity Li-Ion battery allows 20hours operating time (Tx/Rx:Standby=5:5:90) • 1.5W output power on 2m & 1W output power on 70cm • Simple operation • 1000 memory channels with flexible memory bank system • Oversize LCD for clear display of function information



## IC-T90A

**A new 5W Tri-band handheld** • VHF/UHF FM 2M, 6M, & 70CM Wideband receive 495KHz - 1GHz 555 Alphanumeric memories • 13 Scan modes DTCS & CTCSS encode & decode DTMF encoder (10 memories) Wide/narrow transmit capability.

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